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and

Surgery of Trauma

Volume 18 June 1949 Number 6

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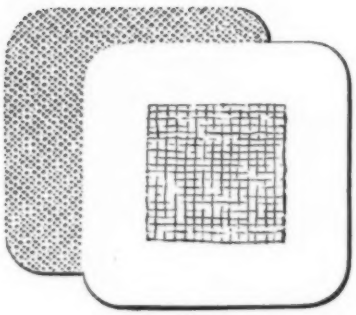

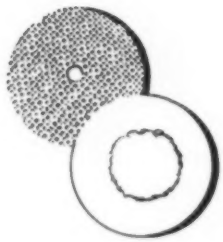

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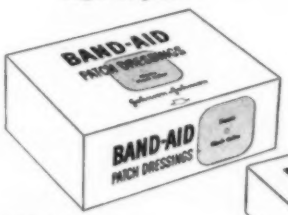

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This magazine is published to promote sound thought concerning industrial medicine and the surgery of trauma. To that end it will contain articles, news items, reports, digests, and other presentations, together with editors' comments. The editorial policy is to encourage frank discussion. On this basis contributions are invited. The editors will exercise care in checking on the accuracy of data printed but in all other respects articles and opinions of which expression is allowed are the opinions of their authors—the editors reserving in all cases the right to comment on the same in the current or any subsequent issues as they may be inclined.

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THE Thirty-Fifth Annual Meeting of the AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS, together with the 1950 INDUSTRIAL HEALTH CONFERENCE will be held in Chicago, Illinois, April 23 to 29, 1950, with headquarters at the Hotel Sherman.

1949 Railway Surgeons Conference, Chicago

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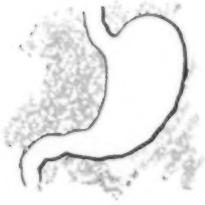

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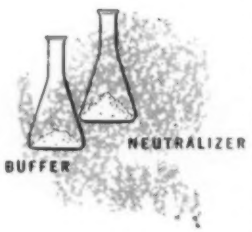

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DR. CLARENCE D. SELBY, Medical Consultant for General Motors Corporation since 1935, is retiring at the end of June and will be succeeded by DR. MAX R. BURNELL, Medical Director of GM's AC Spark Plug Division, at Flint, Michigan, since 1931. During DR. SELBY'S identification with General Motors, the company's medical facilities have been "tremendously expanded and modernized, with more than 100 doctors and 500 nurses and laboratory technicians now devoting their full time to the health maintenance of GM employees." DR. BURNELL organized the medical department at AC in 1931.

DR. JAMES H. STERNER, Associate Medical Director, Eastman Kodak Company, Rochester, New York, has been appointed consultant to the medical section of the Atomic Energy Commission on a part-time basis. DR. STERNER will continue in his present capacity with Eastman Kodak.

DR. GEORGE M. WHEATLEY has been appointed a third vice-president of the Metropolitan Life Insurance Company, and will be concerned with the supervision of the company's health and welfare activities. He is a graduate of Harvard Medical School, Boston, and has been with Metropolitan Life since 1941.

THE AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS is one of the 50 organizations which comprise the membership of the National Council on Rehabilitation. DR. HENRY H. KESSLER is President of the Council.

DR. PAUL A. BREHM, 48, Director of the Industrial Hygiene Division of the State Board of Health of Wisconsin, died suddenly, at his home in Madison, on April 29, of a heart ailment. He graduated at the University of Nebraska College of Medicine in 1925, and practiced in Milwaukee, before going to Madison. He was vice-president of the Wisconsin Council of Safety and past-president of the AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS. He was widely known, and well liked. He will be missed.

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In India

LARGE factories such as the Steel Works at Jamshedpur, Chemical Works at Mithapur, textile factories and others are generally provided with first-class organizations on modern hospital lines for giving curative medical aid, including antenatal and postnatal clinics for women workers. All the same, preventive work of Industrial Medicine proper is only just starting. Pre-employment medical examination for elimination of undesirables is more or less common everywhere, but preplacement examination for finding out the right man for a particular job, and the right job for a particular man is still a new idea. Political freedom is bringing in its wake a new zeal, and new ideas are receiving an extra impetus. It is some such momentum that inspired about three years ago Messrs. Tata Industries Limited to start an Industrial Medicine Department for their Bombay concerns. It may prove interesting to note here a few special conditions the Department has to face. According to 1941 census, 120 out of every 1,000 of the population are literate. Separate statistics of literacy amongst industrial workers are not available. These would very likely show a still lower number of the literates. Due to this illiteracy and concomitant ignorance and superstition, the Industrial Medicine Department is very much handicapped with its program of educative propaganda and in several other directions. I give an example. The department was trying out a diet experiment on children in the Creche of Tata Mills, and it was a part of its program to make a blood count before and after the experiment. After a good deal of cajoling and persuasion we succeeded in getting all the children we wanted for the first blood count, and it went all right. But soon after four children developed whooping cough, and the mothers attributed it to the depletion of the children's blood for the tests. Two among them successfully harangued the rest of the crowd, not to take again any child anywhere near the laboratory door, and we had to abandon the second count. Only 20 to 40% of factory labour in India is stationary, and the rest of it is migratory due to various causes, not the least among them being overcrowding

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and high rents that prevail in industrial towns. This prevents workmen from bringing their families with them and settling down to a normal family life, and the highly insanitary conditions of the slums which alone are available to them fetch them a larger share of community diseases than their proportionate due. Though they are definitely wise in periodically escaping from such insanitary and unsocial surroundings to their villages where at least they can get a bit of freedom and fresh air and a healthy family life, this creates a knotty problem for the Industrial Medicine Department. Useful continuous records of sickness and of periodic medical examinations of individuals become a headache.

—DR. H. P. DASTUR, Medical Officer, Department of Industrial Medicine, Tata Industries, Ltd., Bombay, India, in *Proceedings of the Society for the Study of Industrial Medicine*, 1:1, 29-34, March, 1949.

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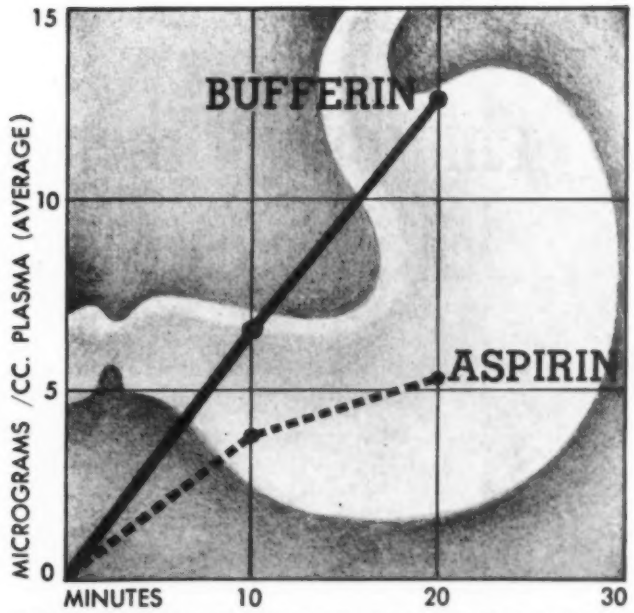

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Chlorophyll therapy in 127 cases of chronic osteomyelitis and ulcers

Excerpts from a clinical report (1) on an investigational study, published in the American Journal of Surgery, 77:162, 1949.

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(1) *Original paper prepared by E. B. Carpenter, M. D., Department of Orthopedic Surgery, Medical College of Virginia Hospital, Richmond, Va.*

Why chlorophyll therapy was employed

". . . The action of chlorophyll as a therapeutic agent is essentially that of a stimulant to cellular metabolism.

"Because of disappointments and failures to obtain early healing in chronic granulomatous processes by the usual classical procedures, and with an increasing number of enthusiastic reports relative to chlorophyll preparations, in recent literature, the writer was stimulated to investigate these (Chloresium) preparations clinically in a carefully selected and controlled series . . .

How the cases were selected

"The cases chosen for this investigation were carefully selected from a busy orthopedic service in a prominent teaching hospital. The cases selected were in each instance chosen by the writer and followed personally throughout their course of treatment and follow-up . . .

"The period covered in this clinical study was nine months: (See: "Follow-up Observations" for final conclusions); 127 cases were selected and treated during this period . . .

"The chlorophyll preparations* used were: (1) water-soluble active chlorophyll derivatives in isotonic solution; (2) water-soluble chlorophyll derivatives in a hydrophylic ointment base; (3) chlorophyll-penicillin solution containing 2,000 units of penicillin per cc. of water-soluble chlorophyll derivatives; (4) fine mesh gauze impregnated with water-soluble chlorophyll derivative ointment.

Results in 59 cases of chronic suppurative osteomyelitis in which surgical intervention was held necessary

". . . Fifty-six healed per primum following the delayed closure and have remained healed without evidence of recurrence of infection or breakdown of the wound. One patient developed several small subcutaneous abscesses following the delayed closure, necessitating incision and drainage of the abscesses. Two wounds failed to heal following the delayed closure and continued to drain . . .

Results in 25 cases of subacute or chronic suppurative osteomyelitis secondary to compound fractures

". . . skin defects were covered and the wounds healed in twenty-three instances. The two other wounds broke down following skin grafting and required additional skin grafting or plastic closures . . .

"Following the start of chlorophyll dressings, the rapid disappearance of the foul odors associated with these cases was very marked in every instance and was most gratifying to both the patient and to the others on the wards.

*The water soluble chlorophyll derivative preparations used in this study were generously supplied by Rystan Company, Inc., Mt. Vernon, N. Y., and are marketed commercially under the trade name "Chloresium."

Results in 22 cases of chronic granulomatous wounds

"The group of chronic granulomatous lesions not associated with underlying bony infection consisted principally of decubitus ulcers. Nine such ulcers were on paraplegic patients and the results here were most gratifying. Early erradication of gross infection, early appearance of healthy granulation and progressive epithelization of these decubiti were marked in every instance. Every patient selected in this group had been treated previously with various local ointments and solutions with uniformly poor results . . . Of the total group of twenty-two cases, failure to obtain healing occurred in six instances.

Results in 6 cases of chronic varicose ulcers

". . . diminution in the size of the ulcer occurred in every instance within two weeks and complete epithelization was obtained in four instances . . . in each case selected very definite improvement occurred with chlorophyll ointment although previously the ulcers had been resistant to all types of treatment.

CONCLUSIONS

"In the treatment of chronic suppurative osteomyelitis, both of hematogenous origin and secondary to compound fractures, the efficacy of chlorophyll solution locally combined with adequate sequestrectomy, produced uniformly rapid erradication of infection, early wound healing and substantial evidence of clinical cures, not previously experienced in this type of infection when treated by the usual time-honored methods of sequestration . . .

"Chlorophyll derivative preparations in the treatment of decubitus ulcers, particularly in paraplegics, demonstrated tissue-stimulating properties, with subsequent early epithelization not previously seen in these particularly slow and indolent types of ulcer.

"Chlorophyll ointment locally as an adjunct to treatment of varicose ulcers previously resistant to all forms of treatment, demonstrated remarkable therapeutic properties in every instance.

Follow-Up Observations after 18 Months

"The period of follow-up has not been less than eighteen months for any case and on a number of cases two years of observation have been possible.

"In the group of patients with chronic suppurative osteomyelitis, of whom fifty-four originally healed following sequestrectomy and delayed primary closure, two have developed recurrence of infection requiring additional surgery . . . The remaining patients have been clinically asymptomatic with no evidence of recurrence of infection...

"The group of cases of osteomyelitis following compound fractures has been very interesting to observe. Of this original group of twenty-four patients, additional surgery has been necessary in six . . . Of the entire group of eighteen patients who have not required additional surgery there has been no evidence of recurrence of infection . . .

"The group of indolent ulcers or decubiti, particularly on paraplegics, have remained healed without evidence of breakdown.

"The 6 cases of varicose ulcers have unfortunately not been followed as closely . . . Observation on three of the most resistant cases has been possible and to date the ulcers have remained healed without breakdown in two of these cases. The remaining case had a 2 cm. area of breakdown which responded rapidly to chlorophyll ointment pressure dressings, with subsequent healing.

"All of wounds (in the 15 cases of chronic suppurative osteomyelitis of the small bones of the extremities) progressed to eventual healing without surgical intervention . . . follow-up on twelve cases has been obtained and there has been no recurrence of infection to date."

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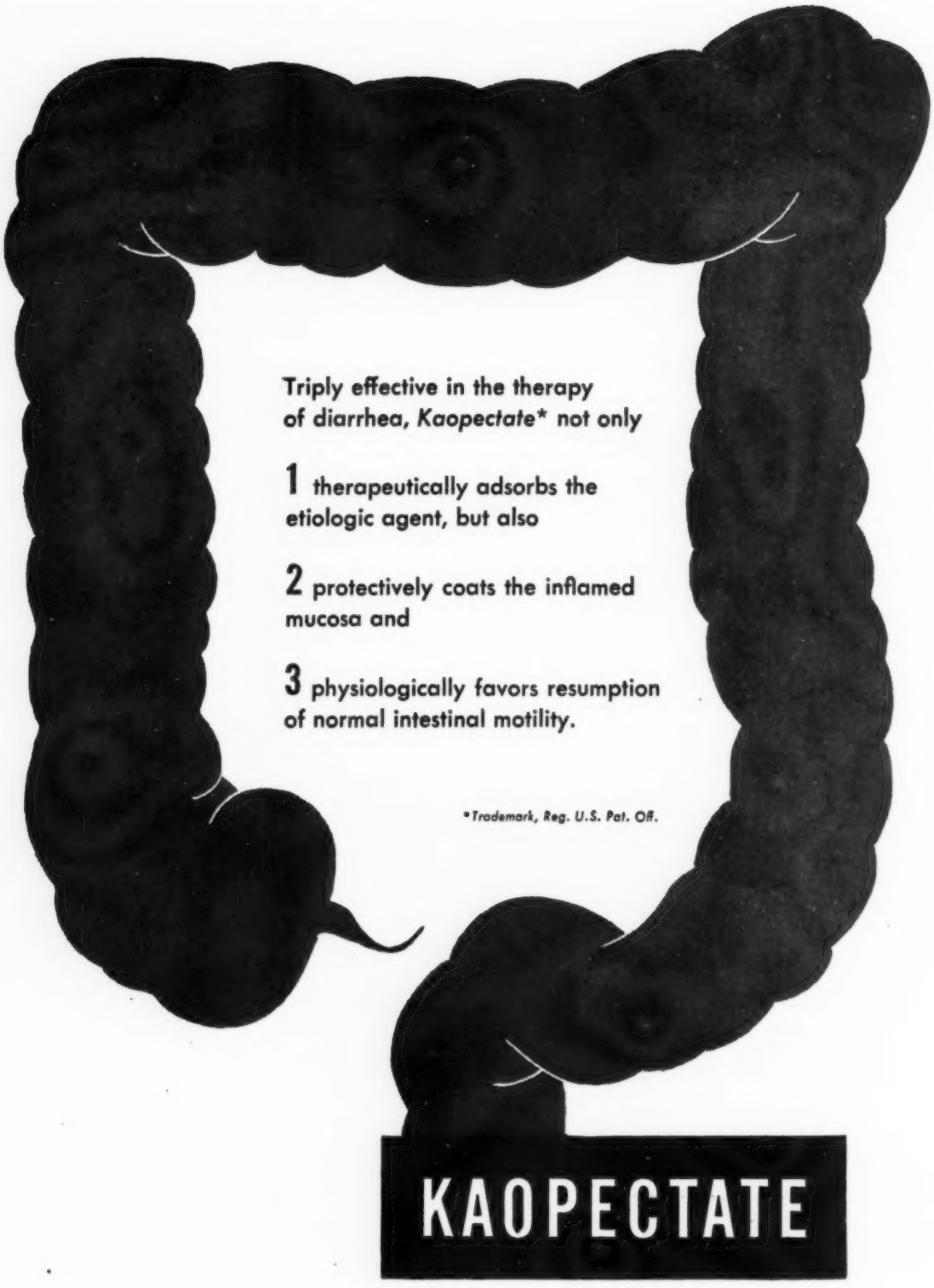
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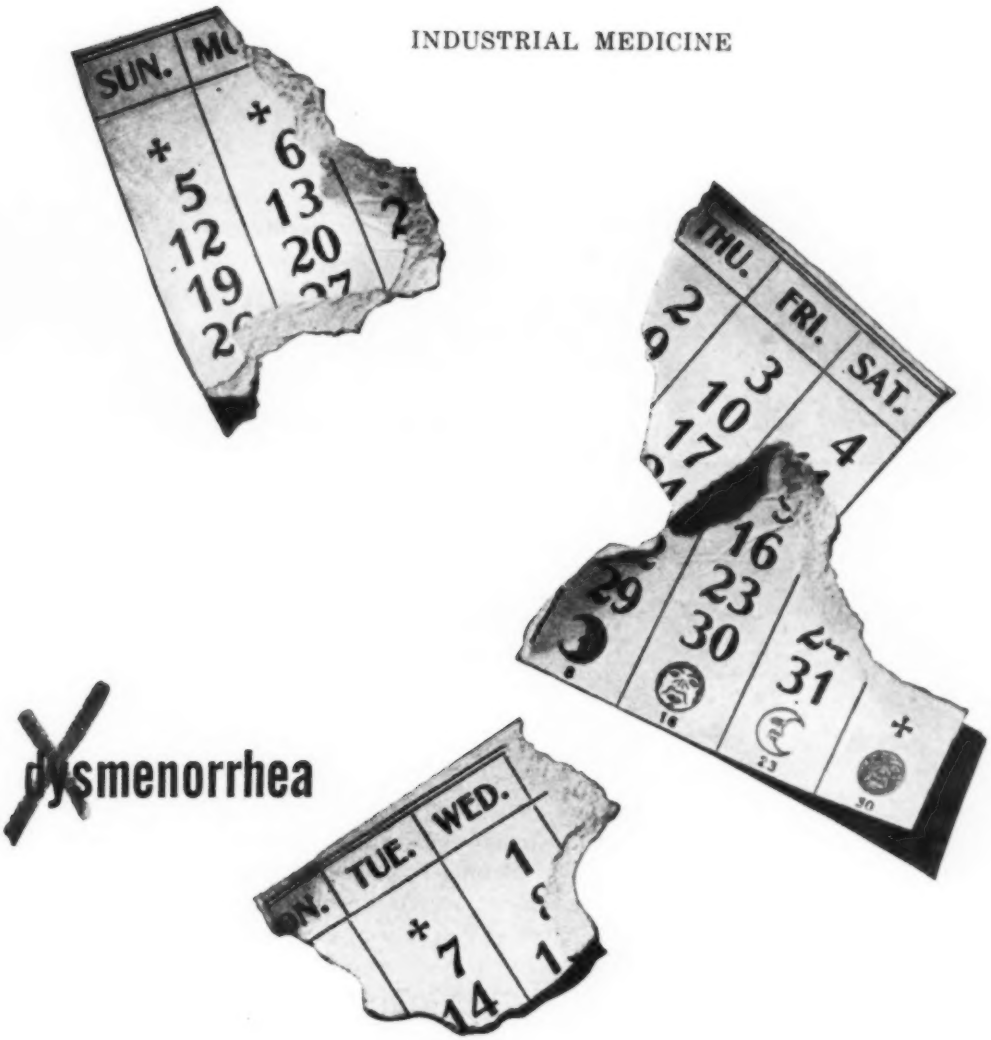

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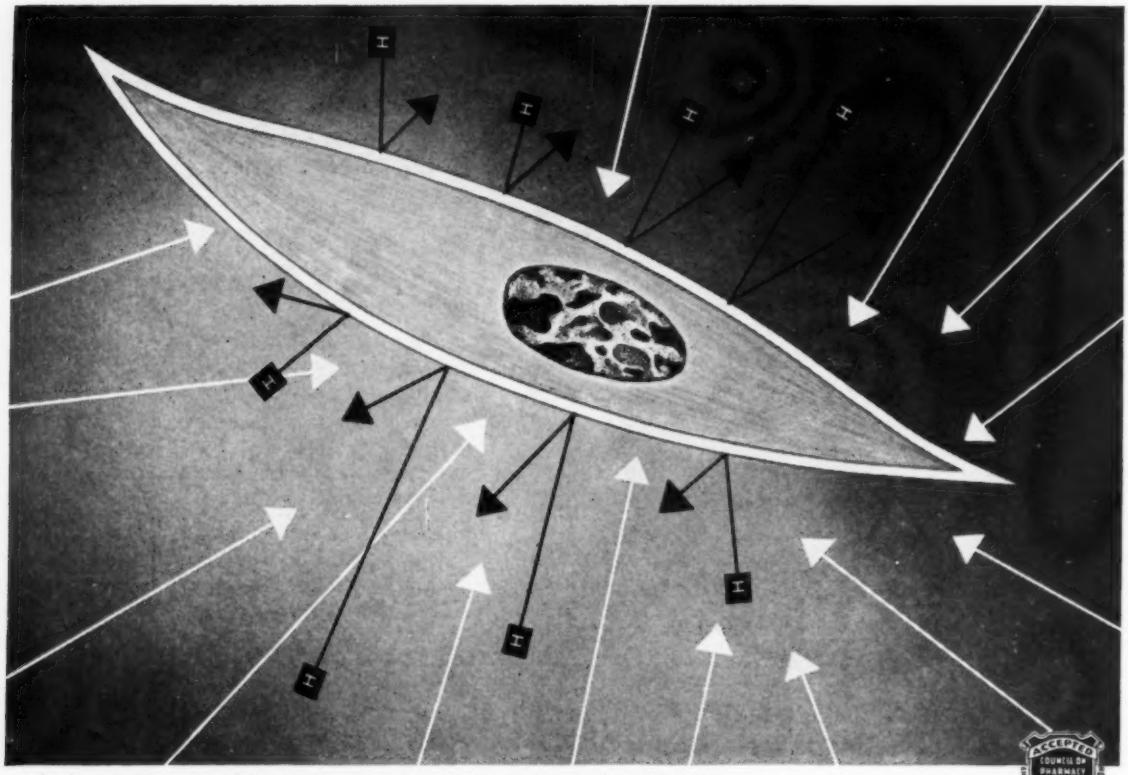

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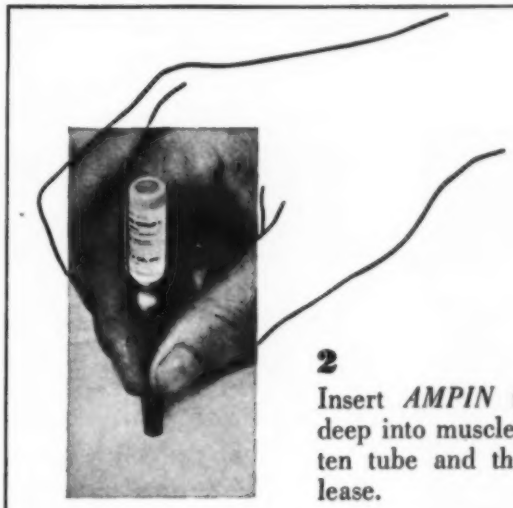
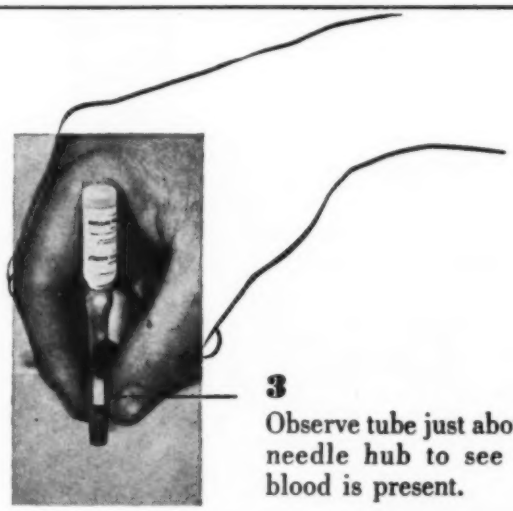
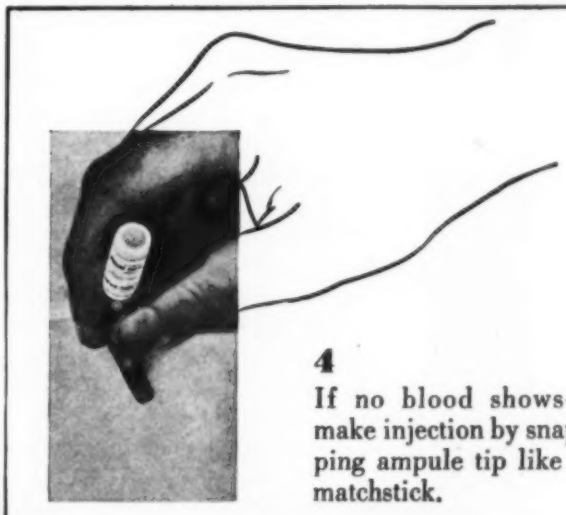
1
After sponging injection site, grasp hub of needle between thumb and index finger. Remove needle cover.



2
Insert *AMPIN* needle deep into muscle. Flatten tube and then release.



3
Observe tube just above needle hub to see if blood is present.



4
If no blood shows—make injection by snapping ampule tip like a matchstick.

*Reg. U. S. Pat. Off. U. S. Patented and Patents Pending

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Carroll and Allen,[1] reporting the results of a clinical study comprising 200 cases, write:

> "The administration of Mandelamine maintained an acid urine without dietary restriction or other drug therapy, excepting in those cases in which urea-splitting organisms were present."

MANDELAMINE'S effectiveness in both acute and chronic cases of urinary infection and its remarkable freedom from toxic reactions further commend it as the urinary antiseptic of choice.

SUPPLIED: Enteric-coated tablets of 0.25 Gm. (3¾ gr.) each, bottles of 120, 500, and 1,000.

1. Carroll, G., and Allen, N. H.: J. Urol. 55: 674 (1946).

*MANDELAMINE is the registered trademark of Nepera Chemical Co., Inc., for its brand of Hexydaline (methenamine mandelate).

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3. No supplementary acidification (except when urea-splitting organisms occur)
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5. No danger of drug-fastness
6. Simplicity of regimen—3 or 4 tablets, t.i.d.

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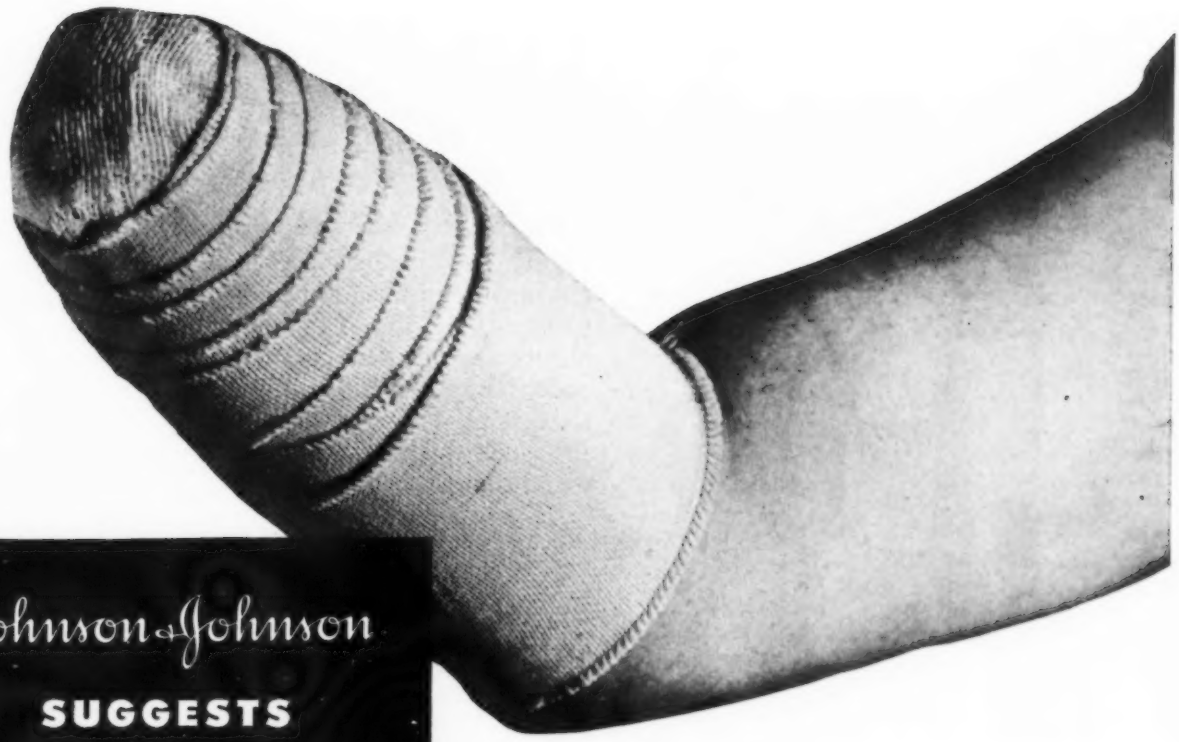

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INDUSTRIAL MEDICINE

Volume 18 JUNE 1949 *Number 6*

Industrial Hygiene and Its Relation to Medicine

FRANK A. PATTY,
Industrial Hygiene Consultant,
General Motors Corporation

MEDICINE and industrial hygiene have much in common—so much that industrial medicine and industrial hygiene have become inseparable. It is impossible at times to establish clear cut lines defining where one leaves off and the other begins. If sharp lines of demarcation are attempted the success of any health maintenance program in which these two form a team is likely to be jeopardized. Industrial hygiene is a study of the environment and of methods for controlling it while industrial medicine, which deals with the individual, is frequently referred to as preventive medicine as distinguished from the more curative aspects of general practice.

Correct diagnosis is, of course, as important in industrial practice as it is in general practice, and aiding in diagnosis is one of the ways in which industrial hygiene can be very helpful to the physician. Whether the ailing workman goes to the plant physician or to his family physician he wants to know what is wrong with him and what to do to recover his health speedily. Let's see how industrial hygiene can help the physician to attain this goal with his employed patients.

Ramazzini, in 1700, published the first book that could be considered a complete treatise on occupational diseases. He accurately described, from personal observations, scores of occupations with their attendant hazards and emphasized the necessity for the physician to inquire into the occupation of the patient. So logical were many of his observations that they remain substantiated today.

Although it was nearly 250 years ago that Ramazzini pointed out this necessity for the physician to inquire into the occupation of the patient, it is still good advice as far as it goes. Up until we were well into the twentieth century unhealthful conditions were believed to be inherent in certain trades. During the last few decades, however, these trades have been studied to detect and evaluate their harmful exposures, and much engineering skill has been brought to bear upon methods of controlling or preventing exposure to toxic materials. As a result, it is no longer sufficient to inquire into a man's occupation, but it is also necessary to know all of the questionable materials or conditions to which he is, or may be, exposed. Not only must the physician know what these conditions are, but he also must know the quantity or intensity of any exposure and what the probable human reactions to this environment are. This information is essential to the physician in order that he may, first, correctly diagnose the illness and, second, remove the cause of illness so that his patient can get well. Obviously if the man has not been exposed to harmful materials his ailment did not result from his working environment, but if there was a known or possible injurious exposure then further investigation to establish the specific cause of illness can be made. Suppose the patient is obviously ill but none of his symptoms is specific. The industrial physician who is fortunate enough to have an industrial hygienist on his staff can refer to the records of the man's environment from the time he was employed and be in a position to judge intelligently whether the patient's disability could or could not be work-connected. The physician can take steps to make certain that any exposure the patient may have had is terminated during the period he is undergoing observation or treatment.

By coordinated effort the plant physician and industrial hygienist can relate plant air contamination to the health of groups of workmen. When medical findings, whether positive or negative, are combined with industrial hygiene information, such as the nature and amount of air contamination to which an individual or group has been exposed for months or years, valuable data for future guidance are accumulated. In this manner tentative air contamination bench marks or hygienic standards are either supported or refuted and corrected.

We see then five ways in which industrial hygiene aids the physician:

1. Recognizing harmful work exposures.
2. Evaluating the exposure.
3. Controlling the exposure.
4. Providing information the physician can use as a diagnostic aid.
5. Providing information for future safe practice standards.

LET'S LOOK at a few examples of industrial exposures and see how the industrial hygienist can be of aid to the physician. Take lead, for example, which is the oldest recorded cause of an occupational disease. As you are well aware, there are a number of non-specific symptoms of lead intoxication and some more or less specific ones that become apparent when the disease

An address delivered before the Montgomery County Medical Society, Dayton, Ohio, February 9, 1949.

reaches or approaches a disabling stage, but there are also tests that the industrial hygienist can perform that will materially aid the physician in reaching a decision. If the patient works in a plant where there are more or less constant and uniform exposures to lead dust or fume, samples of the atmosphere may be collected and analyzed to determine whether the exposure is excessive or within permissible levels.

On the other hand, when the exposure is highly variable and control difficult to maintain it becomes necessary to analyze, for lead, the urine or blood of the exposed person in order to determine the extent of his exposure. These same results are highly significant as a diagnostic aid and, according to DR. KEHOE,[1] cause and effect relationship between lead absorption and non-specific symptomatology on the part of men who have been working up to the time of sampling may be excluded when repeated results are within safe limits, 0.06 mg. lead per 100 grams of whole blood or 0.12 mg. lead per liter of urine, but may be assumed to exist when the analytical results for blood or urinary lead are within the dangerous range, 0.08 to 0.15 milligrams per 100 grams of whole blood or 0.18 to 0.40 milligrams lead per liter of urine. These analyses require the services of a competent analytical chemist and the collection of suitable samples must be under the direct guidance of persons familiar with the working conditions and whose understanding of the physiological and technical background of sampling procedures is complete. The amounts of lead involved are tremendously small and any uncontrolled sources of a trace of lead contamination render the results useless.

Many men who regularly work with lead or its compounds are never exposed to harmful amounts while others with incidental contact may have a serious exposure. Essentially all industrial lead poisonings except some of the cases concerned with tetraethyl lead, result from inhalation of lead or its compounds rather than from ingestion or skin absorption. In automobile manufacture, for instance, lead is used to fill body seams. The lead is frequently applied by heating it with a torch. There is no significant exposure connected with this operation and no special precautions are necessary because significant quantities of lead are not dispersed into the air. The temperature of the lead during application is never high enough to cause significant volatilization. However, in removing the excess lead solder, where power tools such as belt sanders, vibrators, or abrasive discs are used, seriously harmful amounts of lead dust are generated. This more or less invisible dust is so fine that it may float in the air to be inhaled and deposited in the lungs. The operation requires well engineered ventilation control to confine the dust to a small area and provision of respiratory protection for persons working within the area.

An interesting case of lead absorption was brought to light recently in a factory by a routine blood-lead check-up of all employees having a potential exposure to lead. This man was engaged in applying solder as a filler over welded seams, and he had visited the medical department with non-specific complaints of gastro-intestinal disturbances. Atmospheric tests indicated that the environment was safe, no excessive lead exposure, but an analysis of the blood of this man revealed an unusually high lead content. Since the work exposure was believed to be within accepted hygienic practice, inquiry was made into his outside activities and it was found that he was repairing automobile fenders at home by filling dents with lead solder, smoothing it off with a grinding disc, and inhaling lead dust during the process. Incidentally, it further developed that the fellow was stealing the lead from the company and carrying it home for his homework!

The lead storage battery industry may be cited as an industry that necessitates continuous industrial hygiene service. However, where good mechanization, enclosed processes, and well-designed process ventilation are provided, atmospheric lead concentrations can be held down to acceptable levels in all but a few operations in this industry. In these few circumstances the workmen still have to be provided with respirators. Employment in the modern battery plant cannot be assumed to entail exposure to significant amounts of lead.

Painting is another occupation in which we used to assume that excessive lead exposures were the rule rather than—as at present—the exception. There was a time when any painter who developed cramps was likely to be assumed to have painter's colic or plumbism. Nowadays there is relatively little lead used in paints except in house paints, and painting as an occupation in factories no longer carries any implication of harmful lead exposure unless supported by analytical data of lead in the atmosphere or in the biological fluids of the exposed workman. If a painter is found to have plumbism it is frequently necessary to inquire into his outside activities in order to trace the source of his exposure which may prove to be house painting or the more hazardous job of removing old paint in preparation for a paint job.

The foundry is another outstanding example of popular fallacy regarding dust exposures. The foundry environment varies not only with the kind of metal poured, such as steel, iron, brass, bronze, aluminum, or magnesium, but also with industries, communities, experience and attitudes of management and labor, and other factors. The industry as a whole has been subjected to much criticism in recent years and its environment described as "hot, dusty, smoky, unhealthful and hazardous." Such impressions usually have some foundation of truth and that is the case in this circumstance. There are isolated instances where that description applies, but not to the industry as a whole. Foundrymen are improving the environment and are not only desirous of learning of any possibly harmful conditions existing in their plants, but are also ready to listen to any

practical means of controlling them. Foundry managements in general are desirous of controlling exposures known to be harmful, and they want to clean up the plant atmosphere sufficiently to make it a desirable place in which to work. Silica dust exposure in the foundry has been over-rated but nevertheless it is still the most important factor where dustiness is excessive. Sea coal or powdered coal is perhaps the most offensive source of visible dirt and it has been the cause of disastrous dust explosions. Iron fumes, if excessive, may give rise to confusing x-ray photographs of the chest. Cold drafts on a workman's back while he faces a strong source of radiant heat may result in illness. However, these conditions are the exception and cannot be assumed to exist without technical data to establish the facts.

The porcelain enameling industry and the glass manufacturing industry are two other industries regarding which there exists a popular misconception of the nature of the dust exposures. Some of the raw materials used in making glass and enamel contain significant amounts of free silica, and in the grinding or handling of these materials, such as feldspar and sand, there may be opportunity for excessive exposure to free silicon dioxide dust unless the ventilation is well engineered. When the raw materials are fused together to form a frit or glass, however, the free silicon dioxide combines chemically to form silicates and the free silica remaining, if any, is never in significant amounts. It then is not possible to develop silicosis from exposure to dust or mist from the grinding or polishing of glass unless sand is used as the abrasive. Likewise, the grinding or spraying of enameling frit in the process of making porcelain enamel does not present an exposure that can cause silicosis. The dustiness is well controlled, however, because otherwise it would be subject to criticism and would present an annoying nuisance.

Solvents are another class of materials that present inhalation exposures in industry where they are used for various purposes such as metal cleaning and for thinning paints and lacquers. These materials are nearly all fat solvents and, as such, defat the skin upon contact, but absorption through the skin is usually not a matter for serious concern. The fast-drying solvents, by their very nature, evaporate into the air to be inhaled and absorbed unless they are controlled by ventilation. Most industrial solvents are either low in volatility or are of moderate toxicity; petroleum solvents such as mineral spirits or Stoddard's solvent are widely used. Occasionally, or possibly I should say too frequently, however, volatile and toxic solvents are carelessly used. These include benzol, carbon tetrachloride, tetrachloroethane and others.

Carbon tetrachloride is a very popular but dangerous solvent. It is popular for several reasons. It dissolves oil and grease readily and dries quickly, being useful as a spot remover. Its odor is not offensive and is even considered pleasant by some persons. It presents no fire and explosion hazard since it is non-flammable. It is, however, toxic, and prolonged inhalation of relatively low concentrations can cause serious poisoning. It deserves respect both in the plant and at home.

There are a few industrial chemicals known as aromatic nitro and amino compounds, however, which are very hazardous upon contact with the skin. Two rather common ones are nitrobenzene and aniline. These materials can cause serious poisoning from skin contact with soiled clothing, gloves or shoes. Phenol is another common chemical encountered in and out of industry that is dangerous when in contact with the skin in significant amounts.

THOSE are some of the situations that can be anticipated on the one hand or regarded with skepticism on the other. The industrial physician is in a fortunate position in a way, because he usually has to provide medical care for only one group of similarly occupied persons, while the private practitioner has a cross section of the working force of a community. Some, perhaps most, of his working patients are employed in small industries that have no preventive health maintenance program. The problem of recognizing harmful exposures sometimes becomes very difficult in the smaller plants.

When the possibility of an occupational illness presents itself the first source of information to be exhausted is of course the patient, exactly what he does and what materials he works with. His opinion of their harmfulness, though of interest, is frequently grossly erroneous and often colored by personal reasons such as, for instance, a desire for transfer to a more attractive job. It is well to ask him why he thinks he is exposed to an injurious environment and how he thinks it should be corrected.

If the plant where your patient works employs a physician, consult with him and if he is not fully conversant with your patient's environment ask him to investigate it and let you know. If the plant employs no physician, talk to the nurse, the safety engineer, the personnel director, or some other representative of management. If you've never tried getting such information from these sources you have overlooked a good bet. The industrial physician discovers a lot of non-industrial illness that he sends to the private-practice physician. He will appreciate your discussing your occupational cases with him before you jump to conclusions, and if it's the real thing and he has missed it, he will be doubly appreciative to know of it early so he can focus his attention on the environmental problem and prevent a recurrence.

Where it is not possible to obtain satisfactory information from these representatives of plant management, the physician may wish to request the aid of a state, city, Federal, or consulting industrial hygiene agency to investigate environmental conditions at the plant where his patient

works. He may occasionally find it profitable to attend group meetings and ask what the experience of his associates has been with the employees of this same plant. It is very important that the physician in general practice keep abreast of developments in the field of industrial hygiene and toxicology because many new chemicals and many new processes are currently introducing new harmful exposures. The designation of non-occupational diseases as occupational and the failure to recognize occupational diseases are both too common. If offhand misdiagnosis of occupational disease is to be avoided, it becomes necessary to inquire not only into the patient's occupation, but more especially into the factual data regarding harmful work exposures.

I will close by paraphrasing DR KEHOE.[1] Human nature being as it is, there is an inevitable tendency for the workman, members of his family, his legal advisers and, yes, sometimes even his sympathetic family physician, to attribute any obscure illness to the effects of the man's working environment. Therefore, the physician finds it necessary to put forth his every effort in the light of current medical knowledge to confirm or exclude the patient's work as an etiologic or contributing factor in an industrial illness.

(485 West Milwaukee Ave., Detroit 2)

Reference

1. KEHOE, R. A., M.D.: Industrial Lead Poisoning, Industrial Hygiene and Toxicology, Vol. II, Edited by F. A. PATTY, Interscience, 1949, p. 667.

Sore Feet

EMPLOYEES with sore feet cost their bosses $100,-million last year. This toll of absenteeism and operating inefficiency adds a hefty sum to already swollen business costs. Hence, businessmen are scouting around for something to do about their employees' feet. The people to whom most businessmen turn for help are the podiatrists (chiropodists). This week the National Association of Chiropodists met in Washington, discussed what industry has been doing so far to relieve its workers' tired feet. Dr. A. Owen Penney, former president, summed up the picture for association members: Stores and factories account for most industrial foot ailments. There, workers are most apt to throw themselves off balance. Corns and bunions, once formed, are aggravated as the workers try to find relief from pain—again, by off-balance stance. Dr. Penney estimated that 16% of all industrial workers lose as much as a day's work per month because their feet hurt. In addition, aching feet result in slower work, less efficiency in plants. In stores, they mean irritable clerks, greater breakage of merchandise, mistakes—even lost sales and angered customers. Store clerks and factory workers aren't alone in their suffering. Housepainters, roofers, and others who stand for long periods on the rungs of ladders develop a neuralgia of the foot. Delivery truck drivers, because of their habit of jumping from the truck onto the concrete pavement, often develop a painful enlargement of the first ball joint. Then, there is a callous known as "chauffeur's foot" developed by people who spend a great deal of time driving cars or trucks. In contrast, there are the many who have foot trouble because their feet get too little of the right exercise. Dr. Penney cited Atlanta's Fulton Bag & Cotton Mills as an example of what can be gained through foot clinics. Fulton started a free clinic for employees about two years ago. Since then, it has reported a drop of 12% in absenteeism, and a rise in production efficiency (BW—Mar. 6'48,p.26). As a matter of fact, there is a growing list of firms that have taken steps to do something about foot troubles. Woodward & Lothrop, Washington department store, has had a foot-care plan for its employees for 22 years. The workers go to chiropodists as often as necessary and the store pays the bill. Two other department stores —The Hecht Co., Washington, and Filene's in Boston—have chiropodists come in once a week to check and treat employees' feet. The stores pay part of the fee. Murray Mfg. Corp., in Brooklyn, has a chiropodist visit the plant five times a week. When the program was first instituted in 1944, the company paid only a part of the cost. It found, however, that workers failed to utilize the service completely under this arrangement—they were particularly lax about follow-up checks. Since 1945, the company has paid the whole cost of the program. Among large corporations which include foot care in their war-born over-all medical programs are the Henry Kaiser enterprises, Jack & Heintz, Endicott-Johnson, and Sears Roebuck. A survey of working conditions, aimed at preventing foot ailments and accidents, has just been completed in two plants of Ellmore Silver Co., Meriden, Conn. Dr. Charles Forster, chiropodist who made the study, submitted recommendations, including use of rubber pads on the floor where workers stand all day before machines. Many of his suggestions have been put into effect. Other companies cooperating in such surveys include Liberty Mutual, Metropolitan Life, Aetna Life, U.S. Fidelity & Guaranty, Zurich Insurance, The Mennen Co., Bristol-Myers, and International Shoe.

—*Business Week*, February 19, 1949.

Standing Orders for Traumatic Cases in Industrial Dispensaries

THOMAS W. NALE, M.D.,
Medical Director, Union Carbide and Carbon Corporation,
New York

STANDING orders for the industrial nurse in an industrial medical dispensary are just as essential as standing orders for the nurses on duty in our hospitals. The plant physician is the responsible medical authority in a plant, and the nurse should not be given the responsibility of operating the dispensary without standing orders prepared or approved by him.

There are many traumatic conditions occurring in industry that need immediate treatment before the physician can arrive, and there are many minor traumatic conditions that can be given preliminary treatment by the nurse and held until the physician makes his usual visit to the plant. Standing orders protect the workers as well as the nurse. When a nurse treats an injured or ill worker, the patient should know that the nurse is acting on a physician's orders.

The standing orders presented here have been used for several years in a large chemical plant. During this period there was a large amount of construction work being carried on, so that injuries associated with this type of work were also encountered. The orders were revised periodically and the staff of nurses found them very helpful in handling a wide variety of industrial injuries.

Every industrial physician, through his training and experience, has acquired a special knowledge for treating his cases. Some of the standing orders presented here may be cause for a difference of opinion, but this paper will serve its purpose if it presents a plan for setting up such standing orders.

Bandaging

A VALUABLE bandaging manual recommended for the medical dispensaries is Thorndike's "Manual of Bandaging, Strapping and Splinting."

I. *Bandaging Industrial Patients:*

A. It must be borne in mind that there is a difference between the bandage requirements of industrial patients and private patients.

B. An important objective in the bandaging of the industrial patient is to return him as soon as possible to useful employment.

C. If movement is permitted, the dressing should be constructed as to allow free use of the part.

D. If rest is essential, a splint, a sling or elevation is applied to prevent use of a part.

E. Where the lesions are bandaged to permit use of the part, the bandage or dressing must be applied so that: (1) It will not come off. (2) It will adequately protect the lesion.

F. Lesions that would ordinarily require no dressing in private practice are covered on industrial patients because of potential reopening trauma and danger of infection.

G. Splint to lacerated fingers should frequently be resorted to in order to promote rapid healing and to prevent pain if the finger is struck while at work.

H. It must be the responsibility of every dispensary attendant to see that the bandage is applied to stay until the patient re-visits the plant medical department.

Eye Accidents and Injuries

FIRST AID TREATMENT AT THE SCENE OF THE ACCIDENT:

A. Foreign Bodies Entering the Eye:

1. All cases complaining of foreign objects in the eye should be sent to the dispensary. No attempt should be made to remove a foreign body except at the dispensary. If there is a marked burning sensation, the eyes should be thoroughly flushed with water at once and the patient sent to the medical dispensary.

B. Traumatic Injuries (lacerations or puncture wounds) should not be touched at the site of the accident, but sent directly to the medical dispensary. A piece of clean gauze may be placed over the eye.

C. Flash burns or thermic burns of the eye should be sent directly to the medical dispensary.

D. Persons with hot pieces of metal or sparks in the eye should be sent directly to the medical dispensary.

E. Chemical or Irritating Fumes:

1. Flush the eye immediately with large quantities of clean running water for at least five minutes. When eye flushing fountains are available, utilize same. The patient should then be sent immediately to the medical dispensary.

II. *Medical First Aid and Definite Treatment in the Medical Dispensary:*

The use of 2% fluorescein solution in the eye is used to ascertain the extent of injury to the cornea. If properly used it presents no hazard to the eye. The use of this material, however, should be confined to use by a physician or nurses who have had experience and training in its application.

Special Notice: When a local anesthetic (pontocaine solution, pontocaine ointment, holocaine, butyn solution, etc.) is used in the eye for any reason whatsoever, it is extremely inadvisable to permit the patient to leave the dispensary without first placing a pad over the eye or seeing that he is supplied with protective goggles. Marked damage can result in permitting a pa-

tient with an anesthetized eye to return to the environment which has given him a foreign body. He could detect the foreign body previously but with an anesthetized eye he can get a foreign body into it and not know it. A foreign body in an anesthetized eye can cause serious damage.

A. Dusts:
1. Ordinary dusts can be removed by irrigation with normal saline.
2. Always examine the eye carefully for larger foreign bodies, noting especially the eyelid margins. Foreign bodies should be treated as mentioned below.

B. Superficial Foreign Bodies in the Eye:
1. Carefully examine the eye under a good light. Note the edges of the eyelids for displaced eyelashes and for foreign material about the lids. Gently pull down the lower lids and examine the conjunctival folds. Evert the upper lids, as foreign bodies are frequently located on the lid margin. Examine the sclera and cornea minutely.
2. Removal: If the foreign body is located in the conjunctiva or under the upper lid, moisten a small cotton applicator with normal saline solution and gently brush the foreign body off the surface. If a foreign body is lying on the cornea or sclera, place two drops of 0.5% pontocaine solution in the eye and wait for the eye to be anesthetized. Moisten a small cotton applicator with normal saline solution and gently brush the foreign body off the surface. Often very small foreign bodies can be located by staining the eye with fluorescein.

Note: Whenever a foreign body has been in contact with the cornea, always stain the eye with fluorescein solution to see if the cornea has been scratched. The plant physician should always see cases in which the cornea has been injured. Pontocaine ointment and eye dressings should be applied to all cases where there is an injury to the cornea. Remember—a minute laceration or scratch to the cornea may mean an ulcer later on.

C. Foreign Bodies Impacted in the Cornea:
1. Examine the entire eye carefully.
2. If a foreign body is found to be lodged in the cornea no attempt should be made to remove it. The plant physician should see all of these cases and many should be referred to an eye specialist. This is especially true when the foreign body is located near the center of the cornea.

Note: No one except the plant physician should attempt to use any instrument to remove a foreign body.

3. Before any such case is sent out of the plant, place pontocaine ointment in the eye and apply a dressing.

D. Abrasions to the Cornea:
1. Carefully examine the eye for foreign bodies.
2. Stain the eye with fluorescein solution to bring out the extent of the injury. Notify the plant physician. Pontocaine ointment and eye dressings should be applied. The majority of these cases should be seen by an eye specialist.

E. Corneal Burns by Hot Scale (welding and cutting operators):
1. Examine the eye carefully.
2. If scale is seen to be lightly attached to the cornea, apply two drops of 0.5% pontocaine solution and gently brush the scale off. If this does not remove it, let it alone.
3. Stain with fluorescein to determine the extent of the injury.
4. Refer all these cases to the plant physician. The majority of these cases should be seen by an eye specialist.
5. Apply pontocaine ointment and eye bandage.

F. Flash Burns: (These are very painful irritations to the eye due to over-exposure of the eyes to very bright arc, such as the electric arc in electric welding):
1. Carefully examine the eye for foreign bodies or evidence of a burn which might be present that takes a stain.
2. If the eye is negative for other factors, apply two or three drops of local anesthetic in each eye (0.5% pontocaine solution).
3. Apply ice-cold wet dressings to the eye for 10 minutes. (Never apply ice itself to the eyes.)
4. If symptoms persist, refer case to plant physician or eye specialist.

G. Penetrating Foreign Bodies or Puncture Wounds to the Eye: (These are very troublesome eye injuries as far as permanent disability is concerned):
1. If perforation does not result in expulsion of the fluid from the eyeball itself and there is no collapse of the eyeball, an eye pad and head bandage should be applied and the case referred to an eye specialist at once.
2. If perforation results in expulsion of fluid from the eye itself, an eye pad held lightly over the eye should be used. Often placing a pad over the uninjured eye as well will aid in immobilizing the injured eye. These cases should be referred to an eye specialist at once.
3. Do not put any medication in these eyes. If the patient is in severe pain, give morphine sulphate gr. ¼ by hypodermic.

H. Contusions to the Eye: (A contusion to an eye can cause serious damage):
1. Test the pupil to see if it reacts actively to light. Compare it with the uninjured eye.
2. Ascertain if the patient notices any disturbance of vision in the eye.
3. If the eye reacts abnormally, notify the plant physician.
4. Apply cold packs to the eye.
5. The patient should be sent to an eye specialist if the plant physician deems it necessary.
6. Apply an eye patch and dressing.

I. Thermal Burns to the Eye:
1. Burns to the skin about the eye are treated the same as burns to any skin surface. (See "Thermal Burns to the Skin," page 236.)
2. Examine the eye carefully for damaged tissue.
3. Stain the eye with fluorescein for burns to the cornea if they are not readily discernible.
4. Notify the plant physician.
5. Most cases with corneal involvement should be referred to an eye specialist.
6. The initial dressing should be pontocaine ointment to relieve pain. Put an eye patch on.

J. Chemical Burns:
1. If at all possible, ascertain the offending chemical agent. Find out if the material was hot, mixed with other chemicals, solid or liquid, acid or alkaline, etc.

Note: Most acid burns are instantaneous and not progressive. Alkaline burns are nearly always progressive so they are much more dangerous and treatment should be more diligently carried out.

2. Apply local anesthetic to the eye (two or three drops of 0.5% pontocaine solution).
3. Irrigate the eyes continuously with normal saline solution. Utilize a small stream without pressure. Irrigate underneath eyelids, conjunctiva, sclera and cornea. Have the patient roll his eyes around while doing this. This should be continued for at least 10 minutes by the clock.
4. Stain the eye, applying two drops of fluorescein, close the lids, then wash out the excessive fluorescein with saline solution. Examine the eye carefully under a good light to see if the stain is retained by any tissue of the eye. Examine especially the cornea.

Note: Tissue that is damaged retains a greenish coloring of the stain.

5. If the eye has taken any stain, showing burn to the eye, apply two or three drops of 0.5% pontocaine solution and then continue normal saline irrigations for 20 more minutes by the clock.
6. Stain the eye as above. If the eye retains stain to the cornea, notify the plant physician so that he can examine the eye. All cases with positive findings for burns (especially caustic) to the cornea should be seen by an eye specialist as soon as possible. Pontocaine ointment should be placed in the eye and a dressing placed over the eye before sending the patient from the plant.
7. If there is no demonstrable burn to the eye structures after treatment but the eye looks injected and lids swollen, ice-cold wet dressings applied to the eyes often afford a lot of relief. This may be continued for 10 minutes. (Never apply ice itself to the eye.) A simple ointment, such as yellow mercuric oxide ointment, may be applied to the eye.

K. Delayed Chemical Eye Burns:
1. Certain chemicals may cause unusual reactions in the eye. Instead of producing immediate effects, the reaction may be delayed as much as four to 24 hours. This is known as a delayed reaction. They should all be treated as mentioned for chemical burns and should all be seen by an eye specialist.

L. Chemical Fumes: (Fumes can cause burns of the cornea):
1. Ascertain the offending chemical fumes.
2. Irrigate the eyes for five minutes with normal saline solution.
3. Stain the eyes with fluorescein solution and examine carefully under good light.
4. If there is a burn of the cornea, the eye should be anesthetized with 0.5% pontocaine solution and irrigated for 20 minutes by the clock.
5. Re-stain the eye. If the stain is retained, notify the plant physician. The patient should be seen by an eye specialist if the burn is at all severe. Apply pontocaine ointment and dressings.
6. If there is no burn but the eyes remain injected and the lids swollen, cold packs may be applied followed by a simple eye ointment.

Lacerations and Abrasions

FIRST AID AT THE SCENE OF THE ACCIDENT:

A. The lacerated area should be covered by a sterile gauze.

B. Control the bleeding by pressure dressings and/or a tourniquet or utilization of pressure on the pressure points as taught in First Aid.

C. If the patient is in shock, lower his head and, keeping him warm, transport with minimum disturbance to the medical dispensary.

II. *Medical First Aid and Definite Treatment in the Medical Dispensary:*

A. If the laceration is large enough to require suturing, notify the plant physician at once.

B. When bleeding is excessive, pack with sterile gauze. Elevate the lacerated part. Utilization of the pressure points or a tourniquet may have to be resorted to.

C. Where lacerations are in the vicinity of tendons, such as in the hand or wrist, always test the movement of the part below the laceration to ascertain if the laceration has involved a tendon or tendons. When suspecting a lacerated tendon, immediately immobilize the part to prevent retraction of the tendon.

D. Protect the wound with sterile gauze and cleanse the skin thoroughly in a wide area about the wound. For heavy greases, use gasoline, followed by isopropanol and then white soap and water. Dry and paint the area about the wound with an accepted tincture, being careful not to get the tincture into the wound itself.

1. In scalp lacerations or other hairy surfaces, cut the hair from about the wound

at least one-half inch from the edges of the laceration and then shave the area.

E. If the laceration itself is dirty, cleanse with applicators moistened with normal saline solution. In certain cases the wound will have to be flushed with sterile normal saline solution.

F. Apply suitable sterile dressings and bandage.

G. Cases requiring sutures: (Suturing by physician only.)

1. Treatment just discussed should be carried out except for bandaging.
2. A covered tray containing sterile instruments, needles and sutures should be maintained in readiness. Set up the instruments on a sterile towel with sterile sponges, sterile towels, sterile syringes, needles, and ampules of novocaine solution.
3. Use sterile normal saline and soap for further cleansing of the wound.
4. The laceration should be repaired at the discretion of the physician.
5. Sterile dressings and suitable bandages should also be provided.

H. Extensive lacerations:

1. These cases may require hospitalization for final repair, which often necessitates a general anesthetic for proper debriding of the wound.
2. Control any hemorrhage as mentioned before. For active points, the plant physician may have to clamp off or tie off vessels. Prepare instruments as for repair in this event.
3. If the patient is in shock, he must be treated for shock before being transported.
   (a) Give morphine sulphate gr. ¼ hypodermically.
   (b) If shock is severe, give 90% oxygen by inhalations.
   (c) Prevent chilling by use of blankets, etc.
   (d) In severe cases human blood plasma may be used.
4. Endeavor to have the consulting surgeon at the hospital when the patient arrives.
5. An attendant or the plant physician should accompany the patient to the hospital.

Puncture Wounds

PUNCTURE wounds are usually produced by nails or wires; all such cases should be sent to the medical dispensary.

I. *Medical First Aid and Active Treatment:*

A. Ascertain the cause of the puncture wound and location of the accident. Particular attention should be given to the character of the object causing the wound with reference to rust, dirt, etc.

B. Cleanse the area about the puncture wound with soap and water; remove any grease with gasoline and isopropanol.

C. If an extremity is involved, soak it in hot epsom salts solution from 15 to 30 minutes.

D. Where the puncture wound penetrates through the skin and into the deeper structures, many of these cases should have anti-tetanus serum. When in doubt, consult the plant physician.

1. Administration of anti-tetanus serum: (Only when ordered by a physician.)
   (a) Give a skin test by injecting 0.1 cc. of the serum in the skin (intradermally) on the flexor surface of the forearm. Watch the area for 15 to 20 minutes. If the wheal thus produced does not enlarge to any great extent, the remainder of the serum may be given intramuscularly.
2. Whenever anti-tetanus serum is given be prepared to administer adrenalin M.XV if the patient should have a collapse.
3. Never send a patient who has had anti-tetanus serum from the dispensary until at least 30 minutes have elapsed after its administration.
4. Always warn the patient he may break out in hives a week or 10 days after getting anti-tetanus serum.
5. *Note on Tetanus Toxoid.* There may be certain cases where the physician may recommend a booster dose of tetanus toxoid instead of utilizing the anti-tetanus serum. Toxoid is often used in individuals who have been immunized against tetanus.

Crushing Injuries to Digits

FIRST AID AT THE SCENE OF THE ACCIDENT:

A. If the injured part, such as a finger, is exposed, cover it immediately with a sterile gauze.

B. Control bleeding by pressure dressings and/or a tourniquet or utilization of pressure on the pressure points.

C. If the patient is in shock, lower his head, keep him warm, and, with minimum disturbance, transport him to the medical dispensary. Utilize a stretcher.

II. *Medical First Aid and Definite Treatment in the Medical Dispensary:*

A. Examine the injured part carefully. If the bleeding is excessive, control the hemorrhage by elevation of the injured part, utilizing pressure dressings and/or a tourniquet, etc.

B. Notify the plant physician.

C. If the patient is in severe pain, give morphine sulphate gr. ¼ hypodermically.

D. Protect the injured area with sterile gauze and thoroughly cleanse the skin in a wide area about the injury. Use gasoline and isopropanol for heavy grease and then soap and water. Dry and paint the area about the wound with an accepted tincture, being careful not to get the tincture into the wound itself.

E. If suture of the laceration is necessary, prepare for repair of the laceration as described under "Lacerations" (page 231).

F. Crushing injuries complicated by fractures

require splinting. Usually a tongue blade is a suitable splint for a finger or toe. In splinting be sure the part is immobilized. Where several digits are involved, a basswood splint to the extremity is satisfactory.

1. All suspected fractures should be referred to a hospital for x-ray.
2. All fractures with displacement are to be seen by a consulting surgeon.

G. Crushing injuries complicated by evulsion of the nail leave a painful, raw bleeding surface.

1. Cleanse about the area and apply white petrolatum jelly gauze; bandage with suitable bandage.

H. Crushing injuries are sometimes complicated by hemorrhage under the nail.

1. When the area of hemorrhage is near the base of the nail and involves one-half of the nail, paint the nail with an accepted tincture after suitable cleansing.
   (a) Drill a hole through the nail and evacuate the blood.
   (b) Soak the finger in hot Epsom salts solution.
   (c) Apply a dressing.
2. When the area of hemorrhage is near the edge of the nail and is causing a bulging of the tissue, cleanse the area and paint with an accepted tincture.
   (a) Gently slip the point of a sterile knife under the edge of the nail to evacuate the blood.
   (b) Apply a sterile dressing and bandage.

I. Partial amputation of a digit or digits in which amputation is considered necessary.

1. Cleanse as described above.
2. Control hemorrhage as described above.
3. Apply sterile dressings and splint the digit with a tongue blade. Where several digits are involved, use basswood splints.
4. Refer the patient to a hospital and a consulting surgeon for surgical amputation.

J. Amputation of a digit or digits.

Carry out the same procedure as for partial amputation.

Note: In all crushing injuries anti-tetanus serum should be given if the injury is at all extensive, for frequently dirt is ground into such wounds.

Strains, Sprains and Contusions

A CONTUSION is a bruise. A contusion has been defined as "a traumatic solution of continuity of tissue without complete anatomic separation."

A *strain* is an overstretching of a muscle or a group of muscles. There can be various degrees of strain, the maximum would be overstretching to a sufficient degree to produce a rupture of the muscle.

A *sprain* results from the wrenching of a joint with partial rupture or other injury of its attachments without dislocation of the joint. Rapid swelling, heat and pain at the site of the injury usually accompany sprains.

I. *First Aid at the Scene of the Accident:*

A. Prevent motion of the injured part.
B. Remove the patient to the medical dispensary as soon as possible with minimum disturbance to the patient.

II. *Medical First Aid and Definite Treatment at the Medical Dispensary:* (*Note:* Only the more common injuries in this classification will be discussed.)

A. Simple contusions or bruises:

1. Examine the injured part for possibility of fracture. If a fracture is suspected, notify the plant physician.
2. If the case is seen shortly after the accident, apply ice-cold compresses or ice-cold soaks to the part to minimize swelling. Continue for 30 minutes to one hour, depending on the severity of the contusion.
3. In the more severe contusion immobilize the part either by suitable splints or by bandage.

B. Strains: (The most common strain is back strain. The plant physician should see all cases of back strains.)

1. Back strain:
   (a) Place the patient on his abdomen on the treatment table or bed.
   (b) Apply an infra-red lamp for 15 to 20 minutes, having the lamp 12 to 18 inches from the patient.
   (c) Massage the muscles with isopropanol or solid liniment.
   (d) Severe cases should be seen by a physician.
2. Strains to groups of muscles, such as about the shoulder joint, chest muscles, etc.:
   (a) Apply an infra-red lamp treatment to the area followed by massage.
   (b) Apply a supporting bandage and/or an adhesive support as necessary.

C. Sprains:

1. Sprained ankle: (This is the most common type of sprain encountered. At times it is accompanied by fracture or rupture to the ligamentous support to the joint.)
   (a) Use ice-cold applications on the area for at least 30 minutes. This can be accomplished by soaking the ankle in ice-cold water.
   (b) Apply a basket-weave type of adhesive support to the ankle. Apply a figure-of-eight bandage over the adhesive.
   (c) If the swelling is marked or disability noticeable, notify the plant physician.
   (d) All severely sprained ankles should have an x-ray to see if a small fracture or a ruptured ligament is present.
      (1) These cases usually require a cast applied at the hospital.

Simple Fractures

SIMPLE fractures are breaks in the continuity of the bone without breaks in the skin or mucous membrane. Simple fractures may be complete or incomplete, fissured, green stick or im-

pacted. The upper extremity accounts for over 46% and the lower extremity accounts for over 26% of all fractures. The symptoms of a fracture are, first, pain; second, swelling; and, third, limitation of function. Deformities may or may not be present. Only a few of the more common fractures will be discussed.

I. *First Aid at the Scene of the Accident: (Note:* For a complete discussion of this heading, reference is made to the Red Cross Manual of First Aid.)

A. In severe injuries of this type whenever possible first aid should be supervised by the plant physician.
B. The patient should not be moved until a tentative diagnosis has been made.
C. When fractures of the upper leg and hip are suspected, a Thomas splint with extension should be applied.
D. When a fracture of the pelvis or spine is suspected, the patient should be moved only after he has been fastened to a board or ladder-type back splint.
E. Most fractures to the upper extremity can safely be transported to the medical dispensary without splinting. The chest wall can be utilized to immobilize the bone temporarily.
F. Fractures to the lower leg or about the ankle can be transported after application of simple board splints.
G. Protect the patient against shock by blankets, etc., and get him to the medical dispensary as soon as possible with minimum disturbance.

II. *Medical First Aid and Definite Treatment in the Medical Dispensary: (Note:* In all fractures, especially those of the large bones, look for shock. If shock is present, always treat for the same. If the patient has been properly splinted at the scene of the accident, do not remove the splints.)

A. Fractures about the shoulder joints, including the clavicle:
   1. Examine the shoulders carefully for signs of fracture.
   2. Notify the plant physician at once if a fracture is suspected.
   3. Place a wedge-shaped pad of cotton in the axilla.
   4. Flex the forearm at right angles across the chest.
   5. Fix the upper arm to the chest wall with wide adhesive straps.
   6. Apply a bandage from the elbow to over the shoulder.
   7. Support the forearm in a sling.
   8. Refer the patient to a hospital for an x-ray and subsequent treatment by a consulting surgeon.

B. Fractures to the upper arm (humerus):
   1. Examine the arm carefully for signs of fracture.
   2. If the patient is in severe pain, give morphine sulphate gr. ¼ hypodermically.
   3. Notify the plant physician at once if fracture is suspected.
   4. Utilize the Thomas arm splint, fitting it firmly into the axilla.
   5. Apply gentle traction by utilization of a hitch about the wrist and hand with a triangular bandage, which is then tied to the end of the splint. Utilize enough traction to maintain the arm in an extended position.
   6. Apply a wide bandage about the splint so as to support the arm in the splint.
   7. Refer the case to a hospital for an x-ray and subsequent treatment by a consulting surgeon.

C. Fractures about the elbow and upper one-third of the forearm:
   1. Examine the area carefully for signs of fracture.
   2. If the patient is in severe pain, give morphine sulphate gr. ¼ hypodermically.
   3. Notify the plant physician.
   4. Apply a Thomas arm splint as described before.
   5. Minor fractures about the elbow can be handled by placing the arm in a sling and keeping the upper arm adjacent to the chest wall with adhesive.
   6. Refer the case to a hospital for an x-ray and subsequent treatment by a consulting surgeon.

D. Fractures to the forearm and wrist:
   1. Examine the area carefully for signs of fracture.
   2. If the patient is in severe pain, give morphine sulphate gr. ¼ hypodermically.
   3. Notify the plant physician.
   4. Utilize a padded basswood splint and fasten it to the arm with adhesive and bandage in order to immobilize forearm.
   5. Apply an arm sling.
   6. Refer the case to a hospital for an x-ray and subsequent treatment by a consulting surgeon.

E. Fractures to the hand:
   1. Examine carefully for signs of a fracture.
   2. Refer the patient to the plant physician.
   3. Apply a basswood splint to the hand with adhesive and bandage in such a way as to immobilize the hand.
   4. Refer the case to a hospital for an x-ray and subsequent treatment by a consulting surgeon.

F. Fractures to the hip, upper leg (femur) and about the knee joint:
   1. Examine the area carefully for signs of fracture.
   2. Give morphine sulphate gr. ¼ hypodermically if patient is in severe pain.
   3. Notify the plant physician.
   4. Utilize a Thomas leg splint, applying the ring of the splint into the perineal area.
   5. Apply traction by utilization of a hitch about the ankle over the shoe with triangular bandages and fasten firmly to the end of the splint. Utilize enough traction to hold the entire leg in a straight position.
   6. Refer the patient to a hospital for an x-ray

and subsequent treatment by a consulting surgeon.

G. Fractures to the lower leg and ankle:
1. Examine the area carefully for signs of fracture.
2. If pain is severe, give the patient morphine sulphate gr. ¼ hypodermically.
3. Notify the plant physician.
4. Utilize the special aluminum splint that is available for fracture in this area. Pad the splint well with cotton and place the leg into the splint. Bandage into position.
5. Refer the patient to a hospital for an x-ray and subsequent treatment by a consulting surgeon.

H. Fractures to the foot:
1. Examine the foot for signs of fracture.
2. Notify the plant physician if a fracture is suspected.
3. The foot can frequently be immobilized by a firm-fitting bandage which includes a figure-of-eight bandage about the ankle.
4. Refer the patient to a hospital for an x-ray and to a consulting surgeon for subsequent treatment.

I. Fractures to the spine and pelvis:
1. Examine the patient for evidence of fracture.
2. Do not move the patient from the stretcher until he has been seen by a physician.
3. Give morphine sulphate gr. ¼ hypodermically for pain.
4. When fracture is suspected, the patient should be carefully placed on a board or ladder splint and firmly fastened to the same. This must be accomplished without flexing the back.
5. For fractures of the pelvis without injury to the spine, a tight adhesive strapping will frequently immobilize the pelvis. These cases should all be transported on a hard surface and should not be permitted to attempt to move.
6. Refer the case to a hospital for an x-ray and subsequent treatment by a consulting surgeon.

Compound Fractures

A FRACTURE is said to be compound when communication is established between the site of the fracture and the air. The open wound may be caused by external violence or it may be caused by rupture of the skin by the end of one of the bone fragments. Every compound fracture should be considered a surgical emergency.

I. *First Aid at the Scene of the Accident:*
A. Whenever possible first aid treatment should be supervised by a physician.
B. Cover the lacerated area with sterile gauze.
C. Control bleeding by a tourniquet or utilization of pressure on the bleeding points.
D. Protect the patient against shock.
E. If the patient is not severely shocked, proceed to splint the injury with a proper splint as under "Simple Fractures" (page 233).
F. Proceed at once to the medical dispensary with minimum disturbance to the patient.

II. *Medical First Aid and Actual Treatment:*
A. Notify the plant physician at once.
B. If the patient is in severe pain, give him morphine sulphate gr. ¼ hypodermically.
C. If the patient presents evidence of shock, treat for the same.
D. Control bleeding by a pressure dressing, tourniquet, or pressure on the pressure points.
E. Cleanse the area widely about the wound, as is done with lacerations. Paint this area with an accepted tincture.
F. If active bleeding is present, prepare the sterile instruments as for repair of lacerations.
G. Active bleeding points should be ligated at the discretion of the physician.
H. Apply sterile dressings and bandages.
I. Apply a suitable splint, depending on the site of the fracture.
J. All these cases should have anti-tetanus serum.
K. Notify the hospital and endeavor to have a consulting surgeon waiting at the hospital.
L. An attendant or the physician should accompany the patient to the hospital.

Dislocations

DISLOCATIONS are disturbances of normal joint relationships. In a dislocation one or more of the joint surfaces are out of their normal positions. They are often accompanied by minor fractures in the region of the involved joint. The upper extremity accounts for about 90% of all dislocations and 50% of these are shoulder dislocations.

I. *First Aid at the Scene of the Accident:*
A. Prevent movement of the affected joint.
B. Proceed at once to the medical dispensary. When a lower extremity is involved, use a stretcher for the patient.

II. *Medical First Aid and Treatment in the Medical Dispensary:*
A. Dislocation of shoulder joints:
1. Examine the shoulder joint carefully. The head of the humerus will be observed outside of the socket and is usually noted either in front of or behind the socket.
2. If the patient is in severe pain, give morphine sulphate gr. ¼ hypodermically.
3. Notify the plant physician.
4. Prevent motion of the arm.
5. The dislocation is reduced at the discretion of the physician.
6. When difficulty is experienced in reduction, the patient should be referred to a hospital and surgeon for an x-ray and reduction under anesthesia.
7. All dislocations which are at all severe should have the benefit of an x-ray to rule out complicating fractures.

B. Dislocations of other joints:
1. Utilize the same general principles as for shoulder joints.

Major Head Injuries, Including Skull Fractures

IN CASES of head injuries what has happened to the brain is far more important than what has happened to the skull. Severe and even fatal injury to the brain may occur without fracture of the skull.

There may be extensive skull fracture with inconsequential brain damage, maintained consciousness and few, if any, symptoms.

I. *First Aid at the Scene of the Accident:*

A. Do not move the patient until a stretcher is available.

B. Cover the open wounds with sterile gauze.

C. Control hemorrhage. If the skull is intact and there is no depressed area, apply a pressure dressing to control the hemorrhage. Utilize the pressure points.

D. Transport the patient on a stretcher to the medical dispensary at once with minimum disturbance.

E. If necessary, use restraining forces to keep the patient quiet.

II. *Medical First Aid and Definite Treatment in the Medical Dispensary:*

A. Severe Lacerations:

1. Ascertain the cause of the accident with particular reference to blows received or falls.
2. Notify the plant physician.
3. Control any hemorrhage by a pressure dressing.
4. Prepare for laceration repair as described under "Lacerations" (page 231).
5. Test the pupillary light reflexes and see if the pupils are equal.
6. Take and record the patient's blood pressure.
7. If there is evidence of shock, treat for the same.

B. Concussion: (This is a condition caused by violent blows upon the head, attended by vertigo, loss of consciousness, nausea, weak pulse and slow respiration. Even in mild cases patients should be put to bed for at least an hour.)

1. Carefully ascertain the history of the accident with particular attention to the period of unconsciousness and the type of blow or fall.
2. Notify the plant physician.
3. Keep the patient flat in bed.

Note: Do not give morphine to these cases. It masks symptoms and nullifies the localizing value of a dilated pupil.

4. If the patient is quite restless, sodium phenobarbitol gr. 2 may be given intramuscularly.
5. Test the pupillary light reflexes and see if the pupils are equal.
6. Take and record the patient's blood pressure.
7. If the patient is in shock, treat for the same as has been described.
8. When concussion is at all severe, the patient should be referred to a hospital for an x-ray and observation by a consulting surgeon.

C. Fracture of the Skull: (There may be fractures without any deformity or there may be depressed or compound fractures.)

1. Carefully ascertain the history of the accident with particular attention to the type of blow or fall.
2. Place the patient on a bed and keep him warm and quiet.
3. Notify the plant physician.
4. Control hemorrhage, if present, by pressure dressings to the lacerated areas if no depressed fracture is present. Utilize the pressure points.
5. *Do not give morphine.*
6. If necessary, for restlessness give sodium phenobarbital gr. 2 intramuscularly.
7. Look for hemorrhage from the nose and ears. The patient may spit up blood that has run down from posterior nares.
8. If shock is apparent, treat for the same.
9. Where lacerations are present, treat them as described under "Lacerations" (see page 231).
10. All of these cases should be hospitalized.
    (a) Notify the hospital in advance to have a shock bed prepared.
    (b) Refer the case to a consulting surgeon.
    (c) An attendant or the plant physician should accompany the patient to the hospital.

Thermal Burns to the Skin

FIRST AID AT THE SCENE OF THE ACCIDENT:

A. Minor Burns:

1. The affected part should be covered by a sterile dry dressing. No attempt should be made to remove dirt or adherent clothing prior to the application of the dressing. If dressings are not readily available, the patient should proceed at once to the medical dispensary.

B. Severe Burns: (If at all possible, the first aid treatment should be supervised by a physician.)

1. Burned areas should immediately be protected by application of a sterile covering. If burns are extensive, wrap the patient in a sterile sheet and transport at once to the medical dispensary with minimum of disturbance to the patient.

II. *Medical First Aid and Definite Treatment in the Medical Dispensaries: Note:* There are many preparations in vogue in treating burns. The medicinal agents mentioned below will be changed when it is felt that better preparations are available. When considering burns, remember you are dealing with normal cells that have been killed either by heat or chemicals. These dead cells must slough off and later be replaced by new ones. All local treatment should be directed toward preventing infection and helping nature do a better job of getting rid of the dead and damaged cells and replacing them.

A. Minor Burns: (As a rule these are not accompanied by shock of any severity.)
1. Remove all particles of dirt and pieces of adherent material. If the area is soiled, cleanse it with white soap and distilled water.
2. Sponge area with hydrogen peroxide.
3. If there are no blisters, apply white petrolatum jelly and a suitable sterile dressing. (Blisters may form later on.)
4. If blisters have formed, gently open them with sterile instruments. Sponge the area for a second time with hydrogen peroxide. Apply white petrolatum jelly gauze strips to area and thick padding of gauze. This can be held in place with pressure by utilizing stockinette or elastic bandages, depending on the location of the burn.

Note: The plant physician should see these cases if the burns are fairly large.

B. Extensive Burns: (If the burns are deep or if a considerable area of the body is affected, shock must be expected. The external appearance of a burn does not always show the degree of shock which may develop.)
1. Give morphine sulphate gr. ¼ hypodermically.
2. Notify the plant physician.
3. Remove clothing, being careful not to contaminate the burned surfaces any more than possible.
4. Place the patient between sterile sheets.
5. No attempt should be made to open blisters or to clean extensive burns as this may have to be delayed until the patient is in the hospital where an anesthetic may be administered.
6. Apply sterile gauze dressings. As a general rule ointment, etc., should not be applied in the medical dispensary to such cases, as this treatment should be left to the discretion of the surgeon to whom the case is referred.
7. If a case is presenting evidence of marked shock, the patient should not be transferred to the hospital until he is treated for the same:
(a) Give morphine sulphate gr. ¼ hypodermically.
(b) If shock is severe, give inhalations of 100% oxygen.
(c) Prevent marked chilling by use of blankets, hot water bottles, etc.
(d) Human blood plasma may be administered in the dispensary when prescribed by the physician.
8. All these cases should be transferred to a hospital:
(a) Notify the hospital in advance to have a shock bed in readiness.
(b) Endeavor to have the surgeon at the hospital when the patient arrives.
(c) An attendant or the plant physician should accompany the patient to the hospital.

Chemical Burns to the Skin

FIRST AID AT THE SCENE OF THE ACCIDENT:

A. Minor Burns (Small area of involvement):
1. All clothing contaminated with the chemical should be removed.
2. Thoroughly flush the area with running water for 15 minutes.
3. Apply sterile gauze to the area and the patient should then proceed to the medical dispensary at once.

B. Severe Burns (Large area of involvement):
1. Rush the patient to a safety shower, and thoroughly shower with large quantities of water for 15 minutes. Remove contaminated clothing while patient is under the shower.
2. Wrap the patient in a sterile sheet and move him to the medical dispensary with minimum disturbance.
3. Protect the patient from shock by keeping him warm.

II. *Medical First Aid and Definite Treatment in the Medical Dispensary:*

A. Minor Burns:
1. If at all possible, ascertain what chemical is involved.
2. Cleanse the affected area of all dirt and adherent material, using white soap and water if necessary. Preliminary cleansing should include scrupulous care in removing solid particles from the scalp, eyebrows and other hairy areas.
3. Organic chemicals, which are insoluble in water, should be cleansed with alcohol or ether.
4. Thoroughly flush areas with copious quantities of water. This can be supplemented by applying large wet dressings to areas. It may be necessary to keep up this continuous treatment for as long as one or two hours or until redness and swelling leave. By use of litmus paper applied to areas of involvement a general impression can be obtained if either the acid or alkali has been removed from the surface of the skin.
5. After flushing with water to remove all traces of chemical, treat the same as for minor thermal burns. As a general rule it is inadvisable to apply greasy ointments or vaseline to chemical burns during the first 24 hours.

B. Major Burns:
1. Notify the plant physician at once.
2. If at all possible, ascertain what chemical is involved.
3. Give morphine sulphate gr. ¼ hypodermically.
4. Remove the patient's clothing, being careful not to contaminate the burned surfaces any more than possible. If necessary, wash with white soap and water. Preliminary cleansing should include scrupulous care in removing any solid particles from the scalp, eyebrows and other hairy areas.
5. Thoroughly flush areas with copious quan-

tities of water. This can be supplemented by applying large wet dressings to areas. It may be necessary to keep up this continuous treatment for as long as one or two hours. By use of litmus paper applied to the areas a general impression can be obtained if either the acid or alkali has been removed from the surface of the skin.

6. Proceed as for extensive thermal burns, except that in severe cases the patient may have to be sent to the hospital with wet dressings of sterile normal saline or water.
7. In every case presenting evidence of shock, the treatment should be instituted while other treatment is in progress. (See treatment for shock under "Thermal Burns to the Skin," page 236.)

Chemical Irritations of the Skin

THIS classification includes many irritations which are gradual in onset and are not due in all cases to spilling chemicals on the skin. These irritations usually attack the exposed parts of the body, such as the hands and wrists, neck and face, and legs above the level of the socks. Often these can be caused by chemical fumes alone. All of these cases should be referred to the plant physician. (*Note:* Avoid discussing with the patient his condition and its cause, for frequently skin irritation or dermatitis has its origin in factors which have no relation to his work. Never diagnose a chemical dermatitis—leave that to the plant physician.)

I. *Chemical Irritations, Including Those Considered Allergens:*
   A. Ascertain, if at all possible, the offending chemical agent.
   B. Cleanse the skin thoroughly, using white soap and water if necessary. For insoluble material, isopropanol can be used in many instances. Special precautions must be exercised in cleansing about hairy portions of the body.
   C. Soak the areas for 30 minutes with warm Epsom salts solution or Burow's solution soaks.
   D. Dry the area thoroughly by exposing to an infra-red lamp for 10 minutes with the lamp 24 inches from the area.
   E. Apply calamine cream (calamine preparation).
   F. If additional treatments are necessary, utilize Epsom salts soaks, heat lamp and calamine cream.
   G. In the more severe cases subsequent treatment will be the same as for mild thermal burns.

Chemicals with Skin Absorption Hazards

FIRST AID AT THE SCENE OF THE ACCIDENT:
   A. Whenever chemicals, irrespective of their type, are spilled on the clothes, in or on the shoes, the clothing and shoes should be removed and the skin washed with soap and water.
   B. Place victim under safety shower for 10 minutes.
   C. The contaminated clothes and/or shoes should not be replaced but the individual should put on clean uncontaminated clothes and shoes.
   D. Proceed at once to the medical dispensary.

II. *Medical First Aid and Definite Treatment in the Medical Dispensary:*
   A. Ascertain the offending chemical: (*Note:* Be sure to ask patient (1) when the chemical was spilled on the body, (2) how much of the body was exposed to the chemical, (3) how long the chemical remained in contact with the skin. Record these findings in the dispensary record, as the time element and area of skin exposed are very important.)
   B. Notify the plant physician.
   C. If the patient still has on contaminated clothing or shoes, these should be removed at once and the patient should take a shower, using a generous quantity of soap and water on the parts of the body that have come in contact with the chemical.
   D. Check the patient for alteration in pulse rate, blood pressure, temperature and respiration. Notice presence or absence of cyanosis (blueness to lips and finger nails).
   E. If the patient is faint, administer inhalations with aromatic spirits of ammonia or stimulants by hypodermic as advised by the physician.
   F. In the more severe cases, administer oxygen by inhalation up to 95%.
   G. Following is a list of chemicals particularly hazardous because of high toxicity, rapid skin penetration and mild or absent initial skin irritations:
      1. Aniline.
      2. Dichlorethyl Formal.
      3. Ethylene Chlorhydrin.
      4. Ethylene Imine.
      5. Nitrobenzene and similar nitro aromatics.
      6. Organic-metallic compounds of lead, arsenic, selenium, mercury and cadmium.
      7. Oxygenated organic chlorine compounds.
      8. Propylene Imine.
      9. Phenols.
      10. Phenyl Hydrozene.
      11. Some Aliphatic Amines.
      12. Allyl Alcohol.
   H. Special Note on Aniline:
      1. This chemical produces a condition known as "methemoglobinemia." When this is present the individual is quite cyanotic. Be sure to start 100% oxygen inhalations at once and notify plant physician.
      2. The patient will probably have to be transferred to a hospital where he will have to be kept in an oxygen tent for 24 hours or longer.
   I. Phenol:
      1. Any phenol or substitute phenol on the skin must be removed at once in order to avoid a burn or to avoid absorption of fatal

doses. Although these compounds will injure the skin and eyes seriously, the major hazard occurs when they are spilled over a large area of the body (36 to 144 square inches of skin are enough area to produce a fatal skin absorption). Water in large quantities is the material of choice in removing phenol from the skin. It has been proved that alcohols dilute the phenol and increase the skin absorption, therefore they should not be used. Phenols dissolved in oils are absorbed more rapidly than watery solutions. Concentrated oil solutions should be washed off with soap and water and not with oil solvents. Follow soap and water with irrigations of plain water.

Hernia (Rupture)

FOR THE purpose of this discussion we refer to an external abdominal hernia, which is a protrusion of a portion of the contents of the abdomen through an opening in the abdominal wall. The protruded parts are at least covered with skin. Over 80% of all herniae are inguinal herniae. Patients frequently speak of them as strains to the lower abdomen.

I. *First Aid at the Scene of Occurrence:*
   A. If the patient is complaining of severe pain, place him on his back with his hips elevated.
   B. Transport the patient to the medical dispensary on a stretcher.

II. *Medical First Aid and Definite Treatment in the Medical Dispensary:*
   A. Place the patient on his back with his hips elevated and keep him quiet.
   B. Notify the plant physician.
   C. If the protruding mass is large and tender, apply gentle pressure over it in an endeavor to reduce the same.
   D. Morphine sulphate may have to be given to relax the patient.
   E. All large herniae, especially those which are not reducible, should be referred to a surgeon.

Note: All cases where the patient complains of lower abdominal strains should be seen by the plant physician to rule out the possibility of hernia.

Heat Sickness*

HEAT sickness usually manifests itself in one of three forms: Heat exhaustion, heat cramps and heat stroke. Occasionally two of these may be seen in the same patient at the same time, such as combined exhaustion and cramps; or a case may start out as one type and change to another. All types have a common cause—excessive exposure to environmental heat.

The most common form of heat sickness is heat exhaustion. This is usually a mild shock state, resulting from a failure of the circulatory system under the excessive load placed upon it to maintain a normal body temperature. Loss of sleep, any concurrent illness and alcoholism, which in themselves place a demand on the circulatory system, predispose an individual to heat exhaustion. The patient with heat exhaustion is usually cool, clammy and pale. The pulse rate is increased and the blood pressure is decreased. Dizziness and faintness are common at the onset of heat exhaustion. In the event these symptoms are ignored and the conditions of exposure are continued, the person may collapse at his work place. The condition is prevented by strict rules of personal hygiene during hot weather. Salt tablets may have some value as a preventive measure.

Heat cramps are painful contractures of the skeletal muscles that come and go. This condition occurs among people exposed to excessive environmental heat at the same time that they perform strenuous manual labor. The cramps occur most commonly in the muscles that have been used most such as the arms, back and legs. In severe cases there may be in addition, cramps of the muscles of the abdominal wall and neck, and the patient may have persistent vomiting. Heat cramps result from depletion of body chlorides. An increased sodium chloride intake is the only known effective preventive measure. Salt tablets are valuable as a preventive measure.

Heat stroke is a condition of increasing body temperature, as fever which results from fatigue of the thermal regulatory center at the base of the brain. If the condition results from an excessive exposure to the sun, it is called sun stroke. It occurs most commonly in the elderly or physically debilitated people. There is an increased oral temperature, increased pulse rate and blood pressure, flushed and dry skin. Headache is frequently present. The temperature may rise very high. Cases have been reported with oral temperatures of 110° F. Patients are usually conscious but when the fever approaches 105° F, coma may set in. This is an emergency condition requiring prompt and proper treatment.

I. *First Aid at the Site of Exposure:*
   A. Heat Exhaustion:
      1. Remove patient from area of exposure.
      2. Place his head lower than his feet.
      3. Wrap in blankets and move patient to dispensary on a stretcher.
   B. Heat Stroke or Heat Cramps:
      1. Remove patient from area of exposure.
      2. Elevate head and shoulders.
      3. Apply cold wet compresses to the head.
      4. Remove patient to dispensary on a stretcher.

II. *Medical First Aid and Definite Treatment in the Medical Dispensary:*
   A. Heat Exhaustion:
      1. Place patient in bed and lower head of bed.
      2. Cool saline solution by mouth (½ gram of salt to 1 liter of water).
      3. Record oral temperature every hour for three hours. May become febrile. If temperature remains normal the patient may be sent home to rest the remainder of the day.

*Prepared by DR. A. G. KAMMER.

4. Should be seen by plant physician.

B. Heat Cramps:
1. Rest in a recumbent position.
2. Cool saline solution by mouth (½ gram of salt to 1 liter of water), is a specific for this condition.
3. If vomiting is present, intravenous normal saline is prescribed by physician.
4. Record oral temperature every hour for three hours. Occasional case of heat cramps may subsequently develop heat stroke.

C. Heat Stroke:
1. Place patient in bed, elevate the head of the bed.
2. Notify plant physician.
3. Apply cold compresses to the head. Cool sponging of the body and fanning are helpful.
4. Record oral temperature every 30 minutes until it begins to drop.
5. Do not give stimulants.

Note: Patients with fever under 103° F by mouth usually recover with above treatment. Cases with oral temperatures in excess of 103° F should be hospitalized at once.

Noxious Gas Exposures

IT IS BEYOND the scope of this manual to describe a treatment for each individual type of noxious gas. Many of the different gas or fume exposures require the same treatment, which is principally fresh air or oxygen administration after exposure. Of course artificial respiration should always be instituted when indicated by lack of breathing.

The best method of classifying these noxious gases with respect to treatment is that given below, which is based on the morbid physiological response to exposures. This classification is taken from the book on "Noxious Gases" by Henderson and Haggard.

I. *Irritants:*
A. Those affecting mainly the upper respiratory tract. (*Examples:* ammonia, hydrochloric acid, sulphuric acid, hydrofluoric acid and acetic anhydride.)
B. Those affecting the upper respiratory tract and also deeper structures, such as the bronchi. (*Examples:* chlorine, sulphur dioxide, bromine and iodine.)
C. Those acting primarily upon the lungs and to a much less extent upon the upper respiratory tract. (*Examples:* ozone, nitrogen dioxide (nitrous fumes) and phosgene.)
D. Organic vapors which do not follow the general rule as to solubility in relation to location of action. (*Examples:* acrolein (acrylic aldehyde), dimethyl sulphate, halogenated organic compounds.)

II. *Asphyxiants:*
A. *Simple.* These act primarily because when exposure to these noxious gases occurs there is either insufficient or no oxygen present. (*Examples:* nitrogen, hydrogen, helium, methane, ethane, propane and acetylene.)
B. *Chemical Asphyxiants.* These are probably the most important of all because they are responsible for more deaths than any other class of noxious gases. (*Examples:* carbon monoxide, cyanides and cyanogen compounds.)

Note: Carbon Monoxide is an asphyxiant because it has a property of combining with the hemoglobin of the blood and excluding the oxygen from the hemoglobin. *Cyanide* is an asphyxiant because it acts upon the tissues and temporarily deprives them of the capacity to use the oxygen which the blood brings to them.

III. *Volatile Drugs and Drug-like Substances:* (The gases in this classification exert their major action after they have been absorbed into the blood. The one physiological action in common to these substances is that of inducing the symptoms of anesthesia when inhaled in a sufficient quantity.)
A. *Primary Anesthetics.* These produce no marked effect except anesthesia. (*Examples:* nitrous oxide, ethers, aldehydes, gasoline, hydrocarbons of the paraffin, olefin and acetylene series.)
B. *Anesthetic Vapors*—which injure vital organs (liver, kidney). (*Example:* chlorinated hydrocarbons.)
C. *Anesthetic Vapors*—which injure the hematopoietic system. (*Example:* benzene and its homologs.)
D. *Anesthetic Vapors*—which injure the nervous system. (*Examples:* methyl alcohol, carbon disulfides and esters of organic acids.)
E. *Volatile Drugs and Drug-like Substances.* In these anesthetic action is obscured by other and more profound systemic effects, especially on the hemoglobin of the blood and on arterial pressure. (*Example:* organic nitro compounds.)

IV. *Inorganic and Organometallic Gases:*
These include the elements mercury and phosphorus and their organic compounds, which are essentially protoplasmic poisons. Protoplasmic poison is one which even in very small amounts destroys the vitality of any form of living matter with which it comes in contact. (*Examples:* mercury, phosphorus, tetraethyl lead, hydrogen sulfide, diethylarsine and hydrogen phosphide.)

Chlorine Exposure

ALSO applicable for ammonia, hydrogen sulphide, etc:

I. *First Aid Treatment at the Scene of the Accident:*
A. Remove the victim from area of exposure to fresh air at once. The rescuers must be protected by wearing proper masks. If victim is breathing, proceed at once to the medical dispensary. If he is not breathing, place the patient on his stomach, turn head to the side, and begin artificial respiration. Notify medical dispensary.

II. *Medical First Aid and Definite Treatment in the Medical Dispensary:*

A. Place patient on bed or treatment table. Open oxygen cylinder valve, adjust regulator, set meter gauge at 95%; apply meter mask to patient's face and instruct him to breathe slowly and deeply.

B. Continue on 95% oxygen for five minutes and then cut down to 85%. If patient begins to cough, increase quantity of oxygen again to 95%.

C. Gradually decrease quantity of oxygen by varying the percentage. Usually in 15 to 30 minutes, in the average chlorine exposure the coughing will cease. This is usually sufficient treatment.

D. In all cases take and record blood pressure, pulse rate and respiratory rate. Look for cyanosis.

E. In all the more severe exposures, the patient should be checked by the plant physician.

F. All these individuals should be told that they may have irritations of their throat and chest, and if any symptoms develop they should be reported to the plant physician.

Carbon Monoxide

IN RESPECT to resuscitation from carbon monoxide asphyxiation, four main stages occur:

1. The victim becomes unconscious, but he continues to breathe and his heart still beats.

2. He has stopped breathing, but his heart still beats for some seconds or minutes.

3. Both breathing and heart have stopped, but some tonus remains in the muscles for a few minutes.

4. Death occurs and rigor mortis develops.

I. *First Aid at the Scene of the Accident:*

A. No attempt should be made to rescue victim unless rescuers are equipped with proper masks.

B. Remove victim at once to fresh air but not cold air. (Notify medical department.)

C. If victim is not breathing, place him on his stomach, with face turned to one side, and start artificial respiration at once.

D. Obtain inhalator at once. Open valves, apply face mask and give oxygen-carbon dioxide mixture while artificial respiration is in progress.

E. If patient is breathing but unconscious, secure inhalator and give oxygen-carbon dioxide mixture; continue for at least 15 minutes. This same treatment should be carried out in cases that have stopped breathing and breathing has resumed after artificial respiration.

II. *Medical First Aid and Definite Treatment in the Medical Dispensary:*

A. Place patient in bed and wrap in blankets.

B. If patient has not had sufficient oxygen-carbon dioxide inhalation, continue to administer the same until 30 minutes treatment has been given.

C. All cases that have had a sufficient exposure to render them unconscious should be transferred to the hospital for observation.

D. Drugs have little or no value in these cases. The oxygen-carbon dioxide is the treatment of choice. All hypodermic and intravenous medications, and particularly intracardiac injections, are valueless and even harmful.

Cyanide Asphyxiation

ACUTE cyanide asphyxiation is one of the most rapid modes of death. In the ordinary case of acute poisoning, the man falls after a few breaths or even a single breath. Breathing may continue for a brief period but death often follows immediately. In less acute cases the sequence of events is less rapid and symptoms of ordinary asphyxia are more clearly seen.

I. *First Aid Treatment at the Scene of the Accident:*

A. Rescuers should not enter contaminated area unless protected by proper masks.

B. Notify plant physician or other physician at once.

C. Remove victim at once to fresh air and break pearl of amyl nitrate in handkerchief held over nose and mouth of victim.

D. If victim is not breathing, place him on his stomach with his face turned to one side and begin artificial respiration at once. Break a pearl of amyl nitrate in handkerchief and hold over nose and mouth.

E. Obtain inhalator and administer oxygen-carbon dioxide mixture at the same time.

F. If patient is breathing, administer amyl nitrate as above. Use inhalator and give oxygen and carbon dioxide mixture.

G. *Special Treatment to be Administered by Physician and/or Nurse:*

Special equipment is as follows:
Sterile 20 cc. syringe and needles.
Sterile knife and hemostats.
Ampules of sodium nitrate solution and sodium thiosulfate solution.

1. If veins have not collapsed, inject first 10 cc. of sodium nitrate solution into an arm vein and then 20 cc. of sodium thiosulfate solution.

2. If veins are collapsed, cut down on vein and inject as above.

3. Treatment may have to be repeated in 30 minutes if necessary.

II. *Medical First Aid and Definite Treatment in the Medical Dispensary:*

A. Put victim to bed and keep warm. Preliminary treatment by necessity has been carried out at scene of accident.

B. All recovered cases should be hospitalized for further observation.

Oxides of Nitrogen

THE TREATMENT given below is in accordance with the information on this subject found in the Manufacturing Chemists' Association Chemical Safety Data Sheet SD-5-(Nitric Acid).

The treatment for exposures to oxides of nitrogen as nitric acid fumes should be instituted upon a history of exposure and not on the symptomatic response of the individual exposed. The principal hazard is the development of pulmonary edema which may develop five to eight hours after exposure and can prove fatal.

It has been adequately demonstrated that if oxygen is administered promptly and properly in a sufficient quantity the pulmonary edema can be prevented.

I. *Fist Aid at the Scene of the Accident:*
   A. Remove the victim from the area of exposure to fresh air at once. Loosen clothing around the neck and chest. Artificial respiration should not be given unless breathing has ceased.
   B. Remove patient by stretcher to dispensary at once.

II. *Medical First Aid and Definite Treatment in the Medical Dispensary:*
   A. Place patient at rest in bed.
   B. It is at this time 100% oxygen should be administered, preferably exhaled against positive pressure of not more than 6 cm. (about 2⅜ inches of water). This may be effected readily by fitting the face mask to a water bottle, inserting the end of the tube not more than 6 cm. below the surface of the water. A special mask, such as a positive pressure mask, may be obtained for this purpose which does away with the water bottle. This mask has a regulator for regulating the positive pressure from 1 cm. to 4 cm. of water pressure.
   C. Administer 100% oxygen, as above, for 30 minutes out of every hour. Further administration should be supervised by a physician. It has been recommended that such treatment should be carried out for five or six hours, either in the hospital or the dispensary.
   D. Patient should rest in bed for a period of 24 hours under observation of a physician or other experienced personnel to insure resumption of oxygen inhalations should respiratory symptoms appear.
   E. *Note.* Drugs such as morphine, barbiturates or sulphonamides should not be given. Cardiac and respiratory stimulants will be found unnecessary when the underlying oxygen deficiency has been corrected, and they are not recommended.

The above treatment would be applicable to any of the chemical fumes which are capable of producing an edema of the lungs.

(30 E. 42nd St., New York 17.)

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The "Insurance" Delusion

QUESTION: Is Compulsory Health Insurance really "insurance?"
ANSWER: *It is not.* And it is gravely unfair to the people to pretend that it is. Reasons it is not "insurance": (1) Though an arbitrary "premium" is collected, in the form of a payroll deduction, *benefits are neither specified nor guaranteed.* In the exact language of the sponsors, certain services are promised "when funds are available," "insofar as possible," and "when facilities permit"! (2) Sound insurance is based on sound actuarial standards—and on contracts clearly setting forth both benefits and costs. Millions of Americans have such guarantees in writing—under Voluntary Health Insurance. *But the only guarantee in the Compulsory Health "Insurance" proposal is guarantee of a new payroll tax—the amount is unpredictable!*

Acrylonitrile—Its Physiology and Toxicology

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ACRYLONITRILE is a relatively old chemical compound, having been first described in 1893 by Moureau.[1] Even as early as 1911 Desgrez performed some toxicological investigations of the compound in which he used both rabbits and guinea pigs. However, it was not until recently that considerable emphasis both in the fields of chemical research and toxicology has been given to it. The first recorded patent relating to acrylonitrile appeared in 1930.[2,3] The most recent interest has developed since 1935 in the use of the compound as a polymerizable monomer and to a lesser extent as a chemical intermediate.[4] One type of American-made rubber uses acrylonitrile. Owing to its chemical and physiological properties it is especially important in the field of chemical synthesis as an intermediate and will doubtless find increasing usages in the near future.

Physical and Chemical Properties[5,6]

ACRYLONITRILE is a colorless liquid with a mildly irritating odor. It has a boiling point of 77.3° C, and a specific gravity of 0.806 (20° C). The structural formula is $CH_2=\overset{H}{\overset{|}{C}}-C\equiv N$. It is soluble in water to the extent of about 7%. Its inflammable limits in air are 3-17% by volume.

Toxicology

A. ANIMAL:

Acrylonitrile is one of the more highly toxic compounds. Desgrez[7] in 1911 observed that 0.110 grams per kilogram of body weight caused death in rabbits within 10 minutes when administered intravenously in an aqueous solution. He also found that a dosage of 0.085 grams per kilogram administered "hypodermically" resulted in deaths to guinea pigs within 12 hours. More recently Dudley and Neal[8] have reported on the effects to various animal species of single vapor exposures. They observed that a vapor concentration of 635 p.p.m. was fatal to rats with a four-hour exposure and a concentration of 110 p.p.m. for the same period was fatal to dogs. Monkeys were less susceptible, exhibiting slight transitory effects after a four-hour exposure to 90 p.p.m.

In 1942 Dudley, Sweeney, and Miller[9] followed the observations of Dudley and Neal with repeated vapor exposures to various animal species. They observed:

1. Exposures to 56 p.p.m. for four hours daily, five days per week for four weeks produced death in some dogs but no effects on monkeys.

2. Exposures of 100 p.p.m. for four hours daily, five days per week for eight weeks showed some effects (no deaths) on cats but relatively little effect on either rats, guinea pigs, or rabbits.

3. Exposures to 153 p.p.m. for four hours daily, five days per week for eight weeks were harmful to all animals (cats, rats, guinea pigs, dogs, rabbits, and monkeys). They found no real evidence of cumulative action in any of these exposures, although some minor kidney and liver damage was noted in one of the animals.

During 1943 toxicological research sponsored by The B. F. Goodrich Company at Western Reserve University showed that vapor exposures of 30-40 p.p.m. to dogs for 6½ hours per day, five days per week for 10 weeks resulted in more than 50% deaths. No kidney or liver dysfunctions was observed during the life of the animal, but at autopsy minimal changes in the liver suggestive of hydropic degeneration, were found in 60% of the animals. Fifty percent of the dogs showed a patchy atelectasis of the lungs.

More recently Smyth and Carpenter,[10] in range finding studies, have reported the single dose oral toxicity of acrylonitrile for rats to be 0.093 grams per kilogram. They also reported no deaths to rats occurring after a single four-hour vapor exposure of 500 p.p.m., but 100% mortality to an exposure of 1000 p.p.m. for the same length of time. Finally, they found the LD_{50} for rabbits by skin absorption to be approximately 0.25 grams per kilogram.

The mechanism of the physiological action of acrylonitrile is not exactly known. The literature refers in numerous instances to the effects of all nitrile poisoning as being the result of the liberation of free hydrogen cyanide within the body tissues, and the effects of acrylonitrile have been ascribed to this. This suggestion, however, is open to criticism. Acrylonitrile is a rather stable compound and laboratory experiments have not been successful in demonstrating the splitting off of hydrogen cyanide, excepting under conditions which could not possibly be obtained in the human body. Dudley and Neal[8] in their investigation were unable to demonstrate the presence of free cyanide in any of the body tissues or fluids following the deaths of animals exposed to lethal concentrations of acrylonitrile. Likewise they could find no evidence spectrographically of cyanide in the blood of animals so exposed, nor were any changes observed in the absorption spectra of human blood in experiments in vitro.

In support of the free cyanide theory, however, is the fact that sodium nitrite exhibits both protective and antidotal action with acrylonitrile similar to that observed with hydrogen

Presented at the Thirty-Fourth Annual Meeting of the AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS, Section on Petroleum, Rubber and Chemicals, Detroit, April 5, 1949.

TABLE I.[9]
COMPARISON OF THE EFFECT OF ACRYLONITRILE AND HYDROCYANIC ACID ON VARIOUS SPECIES OF ANIMALS

	Acrylonitrile				Hydrocyanic Acid		
	Concentration				Concentration		
		Calculated as HCN					
Species	mg./l	mg./l	p.p.m.	Symptoms	mg./l	p.p.m.	Symptoms
Rats	0.28	0.14	130	Slight transitory effect	0.12	110	Fatal in 1½ hours
"	0.21	0.10	100	Slight transitory effect			
Guinea Pigs	1.25	0.62	575	Fatal during or after exposure	0.35	315	Fatal concentration
" "	0.58	0.29	265	Slight transitory effect	0.23	200	Tolerated for 1½ hours without symptoms
Rabbits	0.56	0.28	260	Fatal during or after exposure	0.35	315	Fatal concentration
"	0.29	0.15	135	Marked transitory effect	0.13	120	No marked toxic symptoms
"	0.21	0.10	100	Slight transitory effect			
Cats	0.60	0.30	275	Markedly toxic	0.35	315	In 2 min. respiratory paralysis, in 5 to 10 min. death
"	0.33	0.17	153	Markedly toxic, sometimes fatal	0.14	125	Markedly toxic in 6 to 7 min.
Dogs	0.24	0.12	110	Fatal to ¾ of the dogs	0.125	115	Fatal to dogs
"	0.213	0.11	100	Convulsions + coma, 0 death	0.1	90	May be tolerated for hours, death after exposure
"	0.12	0.06	56	Transitory paralysis, 1 dog died	0.07-0.04	65-35	Vomiting, convulsions, recovery, may be fatal
"	0.063	0.03	30	Very slight effects	0.035	30	May be tolerated
Monkeys	0.33	0.17	153	Definite toxic effects	0.14	125	Distinctly toxic after 12 min.

cyanide. Dudley and Neal[8] employed an aqueous solution containing 100 milligrams of sodium nitrite per milliliter intravenously and gave to both dogs and rabbits a dosage of 50 milligrams of sodium nitrite per kilogram of body weight. In support of the free cyanide theory, also is the fact that the effects of acrylonitrile and hydrocyanic acid on animals are essentially the same for the same equivalent amount of hydrogen cyanide. This is shown in Table I.[9]

Acrylonitrile is apparently metabolized, at least to some degree, to thiocyanate. This was demonstrated to be present in both the urine and blood serum of dogs by Lawton, Sweeney, and Dudley.[11] These investigators found significant increases in the serum thiocyanate of dogs that had been exposed for four hours to vapor concentrations of 24, 40, and 60 p.p.m. and in urinary thiocyanate contents as long as 24 to 48 hours following the exposure. They suggested this as a possible index of excessive exposure of workmen to acrylonitrile.

B. CLINICAL:

Little data exist on the effects of exposures of humans to acrylonitrile. Wilson[12] in 1944 observed several cases of mild juandice appearing in workmen engaged in the handling of this compound. He found these individuals frequently exhibiting symptoms of vomiting, nausea, and weakness, with headache and fatigue and diarrhea being present. In some cases nasal and an upper respiratory oppressed feeling was noted.

A few observations on workmen at The B. F. Goodrich Company have been made. In these observations an attempt has been made to determine the effects of acrylonitrile exposure on the blood thiocyanate level. Several individuals have been exposed in the normal course of their work to several atmospheric concentrations ranging up to 20 to 45 minutes at a time, with rest periods between exposures. The results of these studies indicate that with an atmospheric concentration below 22 p.p.m. for a 30-minute exposure the blood levels returned almost to normal after 2½ hours of rest. When the concentration was more than 50 p.p.m. for the same length of exposure, the blood level had not returned to normal even after 12 hours.

Mallette[13] in 1943 reported on both blood serum and urinary thiocyanate observations of a number of employees exposed to acrylonitrile. He observed a significant difference between the levels in smokers and non-smokers. He has suggested that as an index of over-exposure, only those values in excess of 3 milligrams percent of serum thiocyanate and 16 milligrams per liter of urinary thiocyanate in smokers be considered as significant, while for non-smokers corresponding values of 2 milligrams percent and 2 milligrams per liter be used.

Boys[14] has observed, over a period of several years, a small group of individuals doing experimental work with a mixture of nitriles. He found in this group a few who showed liver and kidney irritation which promptly disappeared at the cessation of exposure. The exact exposure of this group is not known but is believed to be somewhat above 20 p.p.m.

Treatment

BECAUSE of its mode of action, patients with acrylonitrile poisoning should receive immediately the following routine treatment for cyanide poisoning:

1. Break an amyl nitrite ampoule in a handkerchief and hold it directly under the patient's nose for 20 seconds every three minutes.

2. In cases where poisoning is induced by oral ingestion, lavage stomach with a solution composed of 52 gm. of sodium thiosulphate dissolved in a liter of water.

3. Inject intravenously 10 cc. of 3% aqueous solution of sodium nitrite at rate of 2-5 cc. per minute, then 50 cc. of 6% solution of sodium thiosulphate.

4. Give artificial respiration if necessary.

5. Oxygen may be given by mask or nasal catheter.

When signs of poisoning persist or reappear, the sodium nitrite and thiosulphate may be repeated, using half the quantity originally used. In any case a second injection of the antidotal solutions (using ½ the original quantities) may be given two hours later for prophylactic purposes.

Vitamins B_1 and C have been beneficial in preventing weight loss to laboratory animals exposed to acrylonitrile over long periods of time.

Prophylaxis

ACRYLONITRILE is a toxic compound which requires cautious handling. It has been suggested that the maximum vapor concentration to be tolerated should not exceed 20 p.p.m. Skin contact with the *liquid, solutions,* or *rubber* containing the free nitrile should be avoided not only because of the compound's irritating action, but also because of possible toxic systemic effects. In the case of skin contact with the concentrated compound, immediate washing with copious quantities of soap and water is necessary. Acrylonitrile is readily absorbed by rubber and, consequently, the wearing of rubber gloves for protection purposes is of no value and may in fact increase the possibilities of skin irritation or absorption.

If spilled on the clothing, the clothes should be immediately removed and a shower taken by the individual. The effect of chronic low-grade atmospheric or skin exposures on humans is still undetermined. It is, therefore. advisable that working personnel be given periodic physical examinations, with special emphasis on hematology and liver and kidney functions. The determination of the thiocyanate level in both blood and urine has been suggested as an index of over-exposure.

(B. F. Goodrich Co., 500 South Main Street.)

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Medical Education Needs Company Money

EACH YEAR there is a greater flow of corporate funds to engineering and technical schools. Such contributions are recognized by more and more companies as sound investments. They help sustain the supply of adequately trained engineers for our ranks. These men are essential to continuous improvement in production and products. Except in terms of the tax law, such contributions are not charity. Medical education likewise needs corporate support. In my opinion, the importance of medical departments to industry establishes beyond any doubt that such donations are a proper operating expense. The average tuition for medical schools in the U.S. is $513. The average cost of educating each student is $2,200, a difference of nearly $1,700. These figures do not include the cost of a graduate year which is needed for specialized industrial training. Although tuition can be raised in some degree, the amount possible would make a very unimportant dent in that $1,700. Medical schools cannot survive without adequate funds. We must go to our boards of directors, even stockholders, if necessary, and supplement medical school funds with company money. In making such recommendations we can say that there will be less security for stockholders in business investments unless there are available an adequate number of properly trained men and women from our medical schools. Such people are essential to meeting our obligations to company people. Also, they are an essential if our determination to build better and better human relations within our companies is to be intelligently pursued.

—From an address by WILLIAM B. GIVEN, JR., President, American Brake Shoe Co., at a luncheon meeting in New York, March 31, sponsored by the Commerce and Industry Division of the New York University-Bellevue Medical Center Fund.

A Practical Applicator for Dressing the Various Body Appendages

FRITZ LaCOUR, M.D., and E. G. HENDRICKSON, B.S., M.E.,
Lake Charles, Louisiana

THE problem of applying adequate dressing to the body appendages has never been completely solved on a practical basis. However, a method approaching the ideal is submitted for consideration now. Injured fingers and toes are most difficult to dress surgically, and offer special problems to those people who work with their hands—doctors, nurses, typists, all cate-

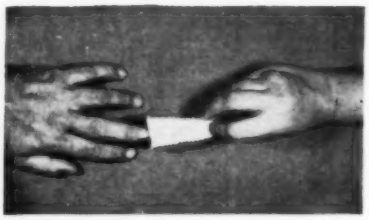

Fig. 1: Bivalve; tube gauze, twice the length of appendage plus one inch. Fig. 2: Tube gauze threaded over bivalve. Fig. 3: Bivalve with gauze engaged over appendage

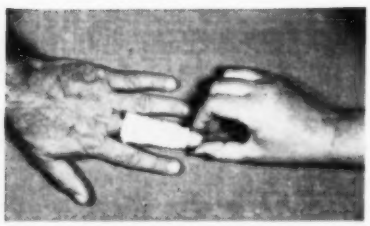
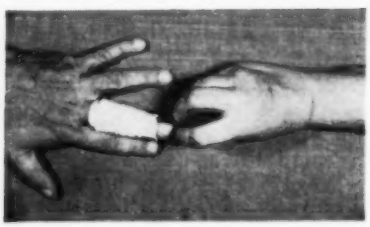
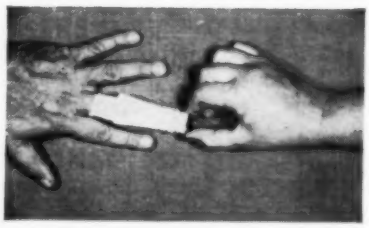

Fig. 4: Bivalve completely engaged. Fig. 5: Gauze slipped over distal end of bivalve and against base of appendage. Fig. 6: Bivalve disengaged leaving first layer of gauze in place

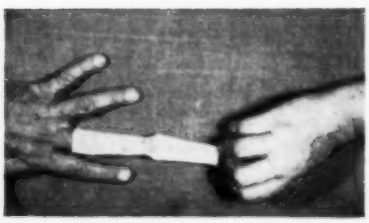
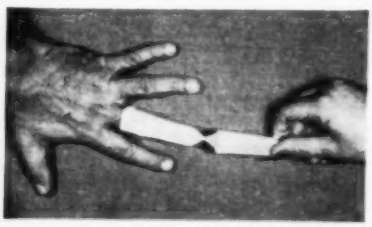

Fig. 7: Bivalve completely disengaged. Fig. 8: Bivalve and tube gauze rotated 360°. Fig. 9: Second layer of gauze reapplied by re-engaging bivalve

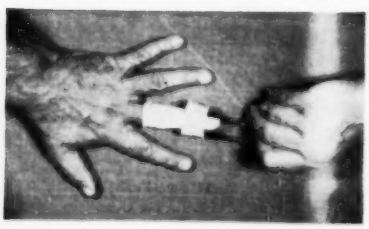

Fig. 10: Gauze slips over finger and retracts as bivalve is pushed to base. Fig. 11: Gauze completely off bivalve and onto finger. Fig. 12: Bivalve finally removed

Fig. 13: Piece of adhesive ½ in. wide to encircle finger at base. Fig. 14: Adhesive applied to base and dressing completed. Fig. 15: Reverse of hand showing completed dressing

gories of industrial workers, etc., who frequently experience injuries to these appendages. Previously the nature of the injury had little effect on the form and/or bulk of the dressing. An appendage dressed in the conventional manner was, for all practical purposes, useless, owing to the size of the dressing. And any activity makes it difficult to keep this type of dressing in proper apposition to the wound.

THE authors believe that the use of tube gauze will eliminate most of the objectionable features of conventional dressings when it is applied with the bivalve applicator. This method has been employed in their industrial clinic for two years and has proved time saving and practical.

It is possible to apply a dressing to any appendage quickly, neatly, and without pain. Where the nature of the injury is such that it does not interfere with function, activity of the part involved will not interfere with the efficacy of the dressing. Only by abuse will the tube gauze become loose enough not to function properly. It has been our experience that with care it may be applied directly to the contused, burned, or lacerated surface of a wound following the necessary preparation without causing any reaction. With tube gauze a contact dressing is optional.

The method of application is simple and requires very little practice. A gauze tube approximately twice the length of the appendage to be dressed plus one inch is cut from the previously sterilized roll. This is threaded over the applicator which in turn is gently slipped over the appendage. The gauze is anchored with the free hand temporarily at the base of the appendage, and the applicator withdrawn slightly beyond the distal end of the member and the bivalve and gauze are then rotated a full 360° and again pushed back over the appendage to its base. The applicator only is finally withdrawn. The bandage is anchored with a small piece of adhesive tape, or a finger cot may be applied over the entire dressing to make it waterproof as well as permanent. More than two layers may be put on at the discretion of the therapist. The authors have demonstrated that a dressing of this type properly applied will stay in place and function adequately for the entire day. It is evident likewise that this type of dressing does not interfere with the function of a finger or toe, nor does it limit the function of the other appendages in close proximity to the one on which it has been placed.

(2523 Helen St.)

Preventive and Industrial Medicine and Public Health —AMA Section Meeting, Atlantic City, June 8-9, 1949—

FOLLOWING is the program for the first two sessions of the Section on Preventive and Industrial Medicine and Public Health at the Annual Meeting of the American Medical Association at Atlantic City, New Jersey, June 8 and 9, 1949. The sessions will be held at the Ritz-Carleton Hotel.

SYMPOSIUM ON AIR POLLUTION (Smog):

Prefacing Remarks:

"Of universal concern to the populace as well as to industry is the effect of smog upon community health and property. Much has been written in lay journals which is erroneous but which has led to unfounded fear and agitation. While it is true that engineers and administrative officers have discussed the problem among themselves, too few of the known facts have been presented before city health officers, industrial physicians, and the general practitioners who must answer questions daily regarding the noxiousness or innocuousness of air pollution. The purpose of this SYMPOSIUM ON SMOG is to bring to focus the latest factual data, to eradicate erroneous opinion, and to offer a guide to future planning."—R. T. JOHNSTONE, Secretary.

1. "The Aspects of Smog: (a) Chemical; (b) Topographical; (c) Meteorological"—H. F. JOHNSTONE, Urbana.

2. "Recent Advances in the Identification of Air Pollutants"—J. A. HAAGEN-SMIT, Pasadena.

3. "Causes, Constituents and Physical Effects of Smog Involved in Specific, Dramatic Episodes (Donora, Muese Valley)"—H. H. SCHRENK, Bethesda.

4. "General Health Aspects of Industrial and Community Smog"—WILLIAM ASHE, Cincinnati.

5. "Approved Control Measures"—W. C. L. HEMEON, Pittsburgh.

6. "Administration of an Air Pollution Control Program"—L. C. MCCABE, Los Angeles.

7. "Summary and Discussion of Papers"—ROBERT A. KEHOE, Cincinnati.

CHAIRMAN'S Address: "Pneumoconiosis and Infection"—OSCAR A. SANDER, Milwaukee.

"Anthraco-Silicosis in Soft Coal Mines"—H. A. SLESINGER, Windber, Pennsylvania.

"Pulmonary Tissue Response to Physical Forces"—SILAS M. EVANS, Milwaukee.

"Functional Pulmonary Impairment in Anthraco-Silicosis"—HURLEY MOTLEY, *et al*, Philadelphia.

"Disability Evaluation in Industrial Pulmonary Disease"—GEORGE A. WRIGHT, Saranac Lake, New York.

Discussion to be opened by WILLIAM S. MCCANN, Rochester, New York.

Personality Disorders of Older Employees

LEONARD E. HIMLER, M.D.,
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THE progressive shift in the age distribution of the population is constantly bringing to the fore industry's responsibility to its aging employees. Management of the special problems of workers between the ages of 45 and 65 is permeated with conflicting opinion, misunderstanding and prejudice. For the individual worker it is in this period when numerous difficulties in both somatic and psychic spheres incident to the process of growing old first make their appearance. Psychiatrists often refer to the years from 40 to 60 as the pre-senile period, and 45 is the age at which the so-called involution begins, followed by the development of arteriosclerotic changes in the brain as well as elsewhere in the body sometime during the fifties. Senile mental changes are said to make their appearance by 60 or 65. This paper will attempt to summarize some of the main psychologic and psychiatric disorders occurring in the involutional years and early senium which frequently become manifest in the industrial setting and which must be recognized and dealt with by industrial medical and personnel departments.

Despite the fact that in practically every industry the responsible work is being done by men and women over 50, the general attitude toward older employees continues to be one of skepticism and under-evaluation. In the face of more evidence to disprove than to support it, the idea persists that after 40 an employee's productivity is usually decreased and that he is too poor an industrial investment to hire or in many instances even keep on the active working force. To many over 45, instead of offering security, personnel procedures seem aimed only at displacing the older workers, thus reinforcing the conviction held not only by the young but by many aging individuals themselves, that age automatically transforms them into industrial liabilities.

The truth is that there is at present little precise knowledge concerning the significant differences between older and younger workers, and seemingly little appreciation of the fact that older workers vary as much as younger persons. One of the important facts which the science of gerontology teaches is that individual differences in the aged are so great that it would be unsound to base broad policies on chronologic age and arbitrarily apply them to all older workers.

True enough there are unwelcome traits and personality difficulties which are characteristic of certain older people, but from an industrial viewpoint these need to be no more troublesome or constitute more cause for inefficiency than the types of personality problems found in other age groups, particularly the younger employees. In fact, when all age ranges are properly equated, the greater number of social and personality problems interfering with industrial efficiency tend to cluster around the second and third rather than the fifth and sixth decades.

The personality traits and emotional patterns usually regarded as detrimental are not so much the product of age as the defeatist and antagonistic attitudes with which age is constantly confronted. It is unfortunate that the contributive potentialities of older employees are often still further undermined by their own misconceptions of the aging process. In order to meet the impact of the aging population upon industry effectively, it is particularly important that executives, supervisors, and labor leaders gain greater insight into this tremendous problem area. Greater understanding is necessary not only regarding the normal aging process, but also with regard to the early manifestations of mental illness as they occur in everyday life.

Personality Assets of Older Employees

THE compensations on the positive side which advancing years bring, both physically and mentally, have not been stressed to the degree they deserve. Under normal and more usual circumstances, age brings better judgment, increased skill, fewer mistakes, and greater steadiness, persistence, and dependability in work habits than are generally found in younger employees. These qualities more than compensate for the gradual slowing of speed which is characteristic of age. Older persons as a rule possess greater emotional stability, take fewer risks, and have achieved a more comfortable acceptance of their capacities and limitations than is usually found in young people. Surveys have shown that absenteeism was generally less frequent among the older workers during the period of full employment when large numbers of them were on war jobs. With respect to work injuries during the same period, older workers had a record that is at least as good as and in some respects even better than that for younger workers. The war experience clearly indicated that in certain very tangible respects older workers held up their end so far as absenteeism, accidents, and the various physical disabilities are concerned. For both sexes the injury frequency rate decreased with increasing age, and the number of medical department visits per person likewise decreased.

Although conclusions based on opinion polls and attitude questionnaires are known to possess considerable fallibility, judging from responses in one such recent survey it is interesting that men over 45 as a group show a consistent and distinct tendency to be more satisfied with their rate of pay, working conditions, bosses, and the treatment which is given to them on the job.

Address given at the Thirty-fourth Annual Meeting of the AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS, Detroit, Michigan, April 7, 1949.

This study also revealed that twice as many men over 45 indicated that they were satisfied with their present job as men in the 20-30 year age range. A fewer number of older workers indicated they would change jobs if they had a chance, and less than 2% felt they were "up a blind alley." Another interesting fact is that, judging from answers to questions on fatigue after a day's work, tiredness is apparently no more a problem to workers over 45 than it is among men in the 20-30 age range. Ten per cent more older than younger men expressed themselves as satisfied even if tired when the day's work is over. For what it is worth, therefore, this study revealed that the attitudes expressed by employees over 45 are precisely those which would place more of them among the most valuable employees from industry's standpoint.

Classification of Personality Disorders

IT IS CUSTOMARY to attempt at least to distinguish between physiological or normal aging and pathological old age, but no reliable criteria for making clear-cut distinctions are as yet available. Ewan Clague, Commissioner of Labor Statistics, U.S. Department of Labor, has suggested a very helpful three-fold classification by means of which the working efficiency of older employees can be evaluated. While primarily designed to assist in assessing physical impairment, this approach also lends itself to a broad classification of the various types and degrees of personality disorders which occur in older workers.

There are, first, many old people who retain their full faculties and vigor to an advanced age and can successfully hold a job or practice an occupation far beyond the normal time of retirement. Whatever personality change occurs in this group is no more than is normal and is to be expected with advancing age, and far from being a liability, the advantages which age brings in experience and seasoned judgment render these men even more valuable to their employer. This is the group in which ability, not age, should be the deciding factor for retirement.

Secondly, there are older employees who because of some accident, progressive disability, or simple decline in mental powers have a gradually lessened capacity for their previous jobs, but are not thereby rendered immediately unemployable. These employees sometimes present serious problems in industry, since, in spite of their declining adaptability, they continue to possess a high degree of employability for some years. The situation becomes more complicated when the individual's personality difficulty has its onset some time before the retirement age is reached. In many instances suitable concessions to advancing years can be made by the employer without adverse strain or friction. Often, however, an older worker in this category resists making the change required by his declining efficiency and fights vigorously to retain his position and status on the job. As a result, a vicious cycle is set up in which the increased emotional strain under which he forces himself to work further handicaps his failing personality resources. Increased risk of accident, personality clashes, exaggerated physical complaints, compensation neurosis, and impairment of departmental morale are too often the unhappy and costly sequels.

Thirdly, there is the group, actually a minority, who suddenly or over a relatively short time develop serious mental disability, usually because of some organic central nervous system disease such as hypertensive encephalopathy or apoplexy. This may occur at any age after 40, and since the brain damage in this group is irreversible, the individual is rendered permanently unfit for industrial employment. In occasional borderline instances the residual neurologic defect may not be great, but the intellectual impairment is such that the individual cannot longer continue in his vocation. In all such cases, the correct medical and psychiatric diagnosis will be the final criterion of further employability.

Industry is frequently presented with a vexing problem when over a period of months or years a valuable employee begins to show changes which tend to classify him in the second or the third groups. In not a few instances slowly progressive deteriorative organic changes are not discovered in the employee's day to day routine behavior, but may come to attention only after some accident, physical illness, or abnormal response to a new situation. Under such circumstances it is extremely important to be able to distinguish those personality reactions in older employees which are unchangeable from those which are reversible when proper psychiatric treatment is provided.

For this reason a fourth category should be added to include neurotic or psychotic illnesses of the involutional years which are serious enough to interrupt employment, yet which carry a good prognosis and do not preclude later resumption of regular work. It is not sufficiently appreciated that the majority of the nervous and mental disorders occurring in the involutional period fall into this category. This holds true also for those requiring hospitalization. Based on my own experience, the following is a list giving the incidence of the eight most common psychiatric disorders occurring in employed men between the ages of 45 and 65 who were hospitalized in a private sanitarium for periods ranging from several weeks to two months:

Manic-depressive psychosis	28%
Depressed phase	20%
Manic phase	8%
Psychoneurosis and psychosomatic disorders	22%
Reactive depression	18%
Other types	4%
Alcoholism	18%
Involutional psychosis	16%
Psychosis with cerebral arteriosclerosis	8%
Psychosis with general paresis	4%
Schizophrenia	2%
Paranoid conditions	2%

It is to be noted that of these hospitalized patients, those who carry the best prognosis for both recovery and reemployability, namely manic-depressive psychosis, reactive depression, involutional psychosis and psychoneurosis, make up 66%. Alcoholism and general paresis, making up 22%, carry a more guarded prognosis, but most of these patients also are able to return to work. The least hopeful, psychosis with cerebral arteriosclerosis, paranoid and schizophrenic psychoses, make up only 12% of the total admissions.

Personality Disorders of the Climacteric

MIDDLE life from 40 to 60 opens and closes with two emotional hurdles—one associated with the climacteric and the other with vocational retirement. People in the fifth decade are frequently troubled by misconceptions concerning the nature of the menopause. About 15% of women have some difficulty during this period. Some suffer only minor discomfort, while others are incapacitated to the extent of being unable to continue with their daily activities. It can readily be seen how the physical symptoms common during this period, such as hot flashes, dizziness, palpitation, headaches, poor sleep, loss of appetite, and a variety of vague pains, can interfere with working efficiency and lead to increased sick absenteeism and frequent calls for medical attention.

There are a number of psychological changes which often coincide with the physiological climacteric, but they may also precede or follow the menopause by five or 10 years. A complaint of general nervousness is common. By this term is usually meant a tendency to be excessively sensitive, irritable, impatient, excitable, fidgety, apprehensive, or depressed. Occasionally when excitability gets beyond control hysterical spells may be precipitated, and these may occur on the job over some slight disagreement or friction. It is not uncommon for women to develop a chronic state of emotional depression with withdrawal of interest from activities formerly enjoyed, along with a slowing of all mental processes.

It is not possible to predict which types of women will have severe menopausal symptoms, but it is a general rule that previously well adjusted women tend to have only minor disturbances during this time. Conversely, women who have not been well adjusted prior to this time are likely to present an increase of previous complaints, and symptoms of psychoneurotic type.

A disorder which is in some respects similar to the menopause is occasionally seen in men between 45 and 55. This is sometimes referred to as the male climacteric, and is characterized by a constant state of anxiety, fear, feelings of helplessness, and severe emotional depression. The precipitating cause for this type of reaction may occur at home or at work, and those afflicted with the disorder tend usually to be ambitious, active, aggressive, hard-working men who are good family providers and devoted husbands and fathers. The disorder is characterized by loss of interest in work, lack of ambition and initiative, inability to make decisions, and a feeling of being overwhelmed by responsibilities. These men are sometimes preoccupied with feelings of guilt regarding some event in their business or personal life, and occasionally have strong suicidal impulses.

It should be obvious that conditions of this type occurring during middle life should be recognized for what they are and not merely treated for some unrelated or incidental physical disorder. They must be distinguished from organic mental diseases and pre-senile and senile deteriorations which carry a much more serious prognosis. Proper medical care including hormone therapy, psychotherapy, and, where indicated, psychiatric referral should all have consideration. Certain individuals who do not respond to out-patient care may require a period of sanitarium treatment. Electro-shock is a useful adjunct to therapy especially where marked depression and suicidal impulses are prominent. A leave of absence from work for six weeks to two months is usually required, after which a vacation of several weeks completes the convalescence before the patient is ready to return to work.

Psychoneurotic symptoms and states of various other kinds may occur during the middle age period both in relation to menopausal disorders and independent of them. One fairly definite type of psychoneurosis not infrequently encountered in men and women in their fifties or sixties is known as reactive depression. This reaction is usually precipitated by situations such as the illness or death of a spouse or close relative, some serious transgression of a favored member of the family, or vocational and economic reverses such as may be the result of a transfer or demotion in work.

The typical case is acutely and almost continuously unhappy, self-centered, uninterested in everything that lacks a direct and obvious bearing on his own welfare, and disinclined to engage in any but the most necessary physical or mental activities. These patients speak deprecatingly of their past and present capabilities and can think of little but their dreary sense of futility and failure.

Recently one such patient, a successful supervisor of 50, came into my office after obtaining a leave of absence from his work, holding in his hand a long list which he headed "symptoms," and which read in part: "tire quickly, weakness, some loss of weight, fear of situations, avoidance of persons, dread of the plant and of working there, no enthusiasm, no permanent interests, bothered easily by little things, weeping without cause, inability to work, jumpy at slight noises, aloneness, forgetfulness, unrestful sleep, negative thinking, lack of faith in anything, even to getting help." This incidentally is an almost classical description of the symptoms of a re-

actionary depression, except for the suicidal preoccupations, which this man also confessed having but could not bring himself to set down. It can readily be seen how such an individual is totally incapable of carrying on his work in the usual manner, and if he forces himself to continue, as many of these patients do, the possibility of inefficiency and accidents is greatly increased.

Manic-Depressive Psychosis

CLOSELY allied and in some instances difficult to distinguish from reactive depressions are depressive phases of manic-depressive psychosis. These frequently make their appearance in outstandingly successful employees, salesmen, supervisors and executives during the middle years of life. The diagnosis is less difficult when there is a definite history of previous manic or depressive episodes with complete recovery. The precipitating factors in middle life usually grow out of some catastrophic occurrence threatening the individual's security or his continued possession of objects to which he has strong emotional attachment. Another related cause is reduced physical fitness, or the threat of this, due to some physical illness incident to advancing years.

It should be noted that such depressive states may be partly masked by physical conditions such as hypothyroidism, and are not infrequently complicated by alcoholism. They may therefore be missed by the physician in his exclusive search for organic disease, and failing that, his ready acceptance of neurotic motivation for the patient's manifest apathy and disinterest. Exact diagnostic differentiation between reactive psychoneurosis and depressive psychosis is of secondary importance to early recognition of the fact that the psychiatric aspect of the illness requires treatment for itself, if the suicidal impulse is to be averted and if the excellent prognosis which this condition carries is to be realized. The institution of prompt psychiatric treatment and where indicated, electro-shock, brings about recovery in over 80% of cases within one to two months time.

Although less frequent in occurrence than depressive episodes, hypomanic and manic states frequently present a much more troublesome problem when the symptoms become manifest on the job. Such individuals exhibit marked psychomotor restlessness and overactivity, become more and more erratic, undependable and reckless in their work habits, show poor judgment and insist on many privileges and useless treatment. Those who become demanding, argumentative, and expansive create much disorganization and friction. When combined with alcoholic excess and refusal to accept medical and psychiatric help, such individuals present a decidedly serious problem in management.

In this connection, the problems of alcoholism with patients in the older age groups are not from the psychiatric point of view significantly different from those occurring in younger age groups. Whether associated with physical or mental disease (or both, as in general paresis), alcoholism continues to be a symptom of an unsolved underlying emotional conflict, from which it represents an unconscious habitual escape. Psychiatric treatment is often not resorted to until all other methods fail, and if the patient cannot at first be brought to accept it, repeated hospitalizations may be required before the well known tendency of the alcoholic to relapse can be controlled. With occasional brilliant exception the prognosis for more than short-term remissions in the severe cases does not usually exceed 50%. Industrial employment and occupational rehabilitation of these patients is a highly individual affair, and in this the consulting psychiatrist should play an active role.

Involutional Psychosis, Melancholia

INVOLUTIONAL melancholia makes its appearance in the years between the late forties and the early sixties, which is the period when individuals undergo the transition from active and productive adult life to that of the senium. It occurs usually in individuals who have not had a previous mental illness, but who show certain rather characteristic personality traits. Many of these traits, incidentally, are the qualities found in employees who have an outstanding record of faithful service and dependability. The individuals most susceptible to this psychosis are usually those who all their life have had strong striving for security and success. They are driving, intense, overconscientious, precise, meticulous, introverted personalities who have few interests outside of their occupation. They make every effort to suppress their emotional conflicts by means of self-imposed restrictions or by overabsorption in work. These are the people who are frequently referred to as self-sacrificing, conscientious to a fault, and as never taking a vacation, whose life becomes a compulsive struggle and is lived according to a stern, unbending moral code. Rigidity is their outstanding characteristic.

Breakdown occurs in these predisposed individuals when they lose possession of the prized feeling of security, or are threatened by loss of human relationships on which they are extremely dependent. The psychosis is characterized by marked emotional instability, depression, agitation, insomnia, restlessness, and retardation of thought and action, and is accompanied by ideas of having committed sin or being poverty-stricken. There are often peculiar fixed ideas concerning bodily functions, particularly of the gastro-intestinal tract. In severe cases the melancholic states are extreme and may lead to attempted suicide.

Depressive reactions and psychotic episodes of the involutional years seldom appear suddenly. There is usually always a prodromal period in which all the symptoms of the fully developed disorder occur in milder form and are frequently associated with or masked by physical complaints

and symptoms. Over 80% of involutional melancholia cases have a prodromal period of six months or longer, and in over 50% this period may be a year or longer. It is unfortunate that the patient's own fear and resistance to psychiatric treatment are often given too much weight in the management of such cases. Keeping these patients on their jobs during this time merely because of their own insistence and their long past record of faithful service is not only of dubious benefit but often materially slows recovery after the institution of proper remedial measures. The management of disorders in this group calls for collaborative planning on the part of the patient, his family, his physician, and his employer, any one of whom may take the lead in obtaining proper psychiatric referral and treatment. Contrary to general opinion, these illnesses are not excluded from the benefits of Blue Cross hospital and medical plans in Michigan. The recovery rate with adequate sanitarium care of one to three months for involutional melancholia is between 85% and 90%; for reactionary depressions it is between 65% and 75%, and for manic-depressive depressions it is 85%. Recurrent attacks are treated in the same manner and carry the same favorable prognosis as a rule.

Cerebral Arteriosclerosis and Senility

IT IS DIFFICULT to draw a fine line of distinction between the normal changes of age and the prodromal manifestations of senile psychosis. Some of the early recognizable symptoms are an insidious weakening of initiative, loss of interest in things normally of vital importance in the person's life, alteration of sleep habits, obvious impairment of memory, comprehension, and responsiveness. There is often a definite exaggeration and accentuation of lifelong character traits, biases, and prejudices. As stated by Henderson and Gillespie, there is not so much a change in personality as a caricature of it.

Older people tend to lose active interest in the people associated with them, on the job as well as elsewhere. Their power of comprehension becomes less elastic, thought becomes more sluggish, and there is slowing of mental pick-up. Decrease in the span of attention results in earlier mental fatigue on effort. Gradual failure of memory is a very prominent feature and is in fact the most characteristic single index of psychological aging. This memory failure affects especially recent events and is associated with a tendency to dwell unduly on remembrances from the more remote past. Misplacement of articles, and the tendency to tell the same stories over and over are familiar evidences of this change. The older individual tends to stick to an idea obstinately and dislikes departure from the beaten track of his daily routine. Conservatism of outlook and action is more or less to be expected from older employees. Hence it becomes much more difficult for them to shift to a new type of work or a new mode of living.

Many older individuals accept their altered capabilities and accommodate themselves calmly, but others react emotionally with various compensation and defense mechanisms. Irritability and querulousness are common symptoms when the older person finds it hard to understand or adapt himself to new circumstances. Some older individuals develop restlessness, over-activity, and garrulity; others tend to withdraw from the people and things they formerly enjoyed.

The mental changes due to cerebral arteriosclerosis are practically the same as those found in senility, except that they occur earlier. It is true however, that there are many cases of cerebral arteriosclerosis in whom mental symptoms never appear. When there is associated hypertension, some of the mental and emotional changes due to progressive cerebral arteriosclerosis may make their appearance at or about the age of 50. Personality disorders in such individuals which materially interfere with their occupational adjustment present serious problems to industry, especially when the older individual has by this time gained a position of considerable prestige and authority, and may cling to the idea that there is really nothing much wrong with him which "a little doctoring or a vacation won't fix up." It is obvious that management of situations of this type calls for not only adequate understanding of medical aspects of the aging process, but also mastery of the proper psychologic techniques—in other words, skill in handling the special human relations of the aging.

While there are many factors determining the individual's resistance or vulnerability to senile mental change, it is certain that useful occupation has a potent influence in retarding the development of actual decline and deterioration. Physicians are all too familiar with the rapid decline in physical and mental effectiveness which follows unwanted compulsory retirement. Older people need more than mere physical comfort and protection. They need especially to be made to feel that the knowledge, skill, and experience they possess shall be made use of in the service of society.

Industry must of necessity play an increasingly active part in this important human conservation program.

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Medical Service in the Coal Fields

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IN 1948 the MINE PHYSICIANS ASSOCIATION became a component part of the AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS. Our physicians appreciate this affiliation. This is our first paper on your program.

The purpose of this paper is to acquaint you with the medical service as now rendered to between five and six hundred thousand miners and their families in the coal fields of the United States. It is to introduce to you a pre-payment medical plan which has been in force for approximately 100 years; and to show you its good and bad qualities, together with the plans for medical care in the future.

Coal was first discovered by Marquette and Joliet in 1673 on the Illinois River about 80 miles south of Chicago. Since that discovery, the coal industry has gradually developed into a five-billion dollar industry, mining over one-half billion tons yearly. More than 600,000 men were engaged in the mines during the war period, and many more thousands were employed in the handling of coal products. The miners with their families make up over two million of our population.

The coal miner in the past has been regarded with a sympathetic attitude, because of his type of work and his standard of living. John Wesley, in the 18th century, gave a vivid account of the coal miners in England and Wales. In 1948, Col. R. R. McCormick, of the *Chicago Tribune*, decried the standard of living of the coal miners of Scotland. Such living standards have been typical of the coal mining fields of America, but with chemistry developing over 200,000 by-products of coal, and with our tremendous coal deposits, we have assurance that the miners and their families will have continued employment for centuries to come. There is not another industry that gives such assurance.

In August, 1948, the bituminous coal industry of the nation paid its workers an average wage of $77.80 per week. This is higher than any other industry. These same workers get 20 cents per ton royalty on all coal produced for a welfare and retirement fund which is being used to finance medical care for many conditions not taken care of by the regular insurance funds which give limited protection. The coal miner is looking forward to solving many of his medical and welfare problems, and this may well set a pattern for other American industries. In 1910, 10,177 miners were killed in catastrophies and other disasters. On May 10, 1910, the U.S. Bureau of Mines was formed. Various safety measures were instituted. The records show that it is becoming increasingly safe to work in the mines. At the turn of the century there was a fatal accident for every 150,000 tons of coal mined. In 1948 there was only one fatality for every 700,000 tons of coal mined. The Labor Department records show that 1,010 men were killed last year. All of this with machinery which was first considered unsafe and condemned. Today with improvements and ventilation, it is rare to see cases of carbon monoxide poisoning. The compression fracture of the vertebrae with injury to the cord is one of our most frequent accidents and certainly the most serious. This injury is almost peculiar to the mining industry and presents one of our greatest problems in rehabilitation. The number of cases of ruptured intervertebral disc is very high. Silicosis and bituminosis are two conditions about which much doubt exists as to their frequency and cause. The so-called miner's asthma is very prevalent. A careful survey should be made of the subject before this is classified as an occupational disease. With the present record system and investigation by the welfare organization this problem might be on the way to solution. One of the greatest drawbacks to good care for the miner is the fact that the average physicians in mining camps have not been trained in industrial medicine. They have been trained for, and are engaged in the general practice of medicine, and very few are equipped or have the time to care for the industrial accidents or to give proper attention to the rehabilitation of the injured miner. Until recently I have known of no comprehensive program for the rehabilitation of the disabled miner in the entire coal fields. Only a few months ago the miners' welfare and retirement fund began financing and developing a very definite program for rehabilitation. The beginning of the rehabilitation of the paraplegic has been one of the most material developments during the past year. Management and labor should cooperate fully in attacking this medical as well as social problem.

THE pre-payment plan of medical care has been used by most of the miners for approximately 100 years. The first history of its having been used was in Maryland and Pennsylvania, and the system spread as the coal fields developed. This system of contract practice or list practice is traditional in the bituminous coal fields. At first the miners paid for the services of camp physicians, and later they developed hospital care under the same plan. These services are paid for in advance from payroll deductions. This is almost the identical system now known as pre-

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payment medical care and is widely subscribed to by the population of the United States. Nearly every state has developed a pre-payment plan, for both hospital and medical care. These pre-payment plans are being put forward as our most powerful weapon against state medicine. The American Medical Association gives them its full endorsement. At present it is claimed that over 50,000,000 people have some plan for pre-payment medical care. The system as practiced in the coal fields was born of necessity. The average coal miner has been accused of having a bad sense of financial responsibility. It is my opinion that he would not have been able to meet the financial problems of illness by any other method. This particular plan as employed in the coal fields differs from most of our pre-payment plans in that it generally designates a definite physician and hospital. By this method there was no choice of physician or hospital after the contract was made. The coal camp was generally in an isolated section, and every camp had to employ its own physician or hospital in order to have medical service. In the past these camps were not accessible, owing to poor road conditions. Today I know of no camp that does not have accessibility by roads. The camps are not isolated as they were in the past and, therefore, they should have a freer choice of medical and hospital service.

To understand the advantages and disadvantages of such a system I think the report, A Medical Survey of the Bituminous Coal Industry, by ADMIRAL JOEL T. BOONE, M.D., should be carefully read. This survey was made in 1947 at the request of the Secretary of the Interior and the president of the United Mine Workers, and it includes housing, sanitation, and social and economic life, as well as hospital and medical services. The report is very comprehensive; it is, indeed, a classic. It should be included in the library of every physician in the coal fields. The author of the report should be commended for the great compilation of facts and for the fair and unbiased attitude he has shown in his preparation and in his conclusions. The members of the survey team were chosen from Navy personnel, all of them being well trained in their special fields. In my limited discussion I am not taking into consideration the associated problems such as sanitation, housing, social service, etc. I was born in the coal fields of Eastern Kentucky, and have spent 22 years in active practice, being on the staff of a hospital located in the center of a coal mining area. This hospital is typical of many such hospitals in the coal fields. It is privately owned and has a capacity of 70 beds, last year admitting approximately 3,200 patients.

THE advantages and disadvantages of the pre-payment plan as carried out in the coal fields have become quite apparent. The advantages lie chiefly in the fact that a definite medical service was always made available even in isolated communities. A progressive physician can do much in every mining camp in preventive as well as curative medicine. The disadvantages are that the patients do not have a free choice of physician and much of the incentive of competitive practice is gone. Seventy per cent of our miners have received their general medical services through these mining camp physicians.

A Scotsman, James M'Kilop, visited the coal fields in western Maryland in 1869 and wrote of the mining camp physician who was getting one dollar per month deducted from the miner's wages. Today these physicians are paid from $2.00 to $3.50 for each miner on the payroll, the average being about $2.50. In areas that are highly urbanized, as in the Pittsburgh section, only about 45% of the coal camps offer this service, while in the more rural areas, as in Kentucky, Virginia, West Virginia, and Tennessee, 86% have it. In past years the selection of the physicians and the hospitals was most frequently assumed by the management of the coal company. Recently, however, the voice of the labor union has been heard and heeded. Today these services are selected more or less by mutual understanding on the part of both management and labor. Often the physician was not chosen on his professional qualities but on his popularity with one or other of the two factions. He was attracted to the isolation of these coal camps frequently by a guaranteed income, and all too often he was concerned with his income rather than the services he rendered. This was especially true when the ratio of physicians to the population was greater than at present. The camp physician was isolated from medical associates and the incentive for competition was lacking. Some physicians kept clean, attractive offices, but, according to the Boone report, "At least half were unattractive, meagerly furnished, and fitted with scarcely any more equipment than a general practitioner's bag contains. A few of the physicians maintain unattractive and disorderly offices in company camps, conducting private offices in nearby towns to handle non-contract cases. These offices where patients were seen on a fee-for-service basis in normal competition with other physicians, invariably were tidy, well kept, and adequately equipped." Such is the normal reaction of many good men to the two types of medical practice—a bad reaction to the contract practice, and a good reaction to the fee-for-service basis. Undoubtedly both the physician and patient have badly abused the contract type of practice and have literally broken down the system, with the result of bitter criticism of many contract physicians and dissatisfaction on the part of the patient. This gives a great, forceful, and penetrating reason against the socialistic type of medicine which limits the patients' choice of physician, while at the same time obliging the doctor to take care of patients that are very disagreeable to him. As World War II caused a scarcity of physicians, and bickering between management and labor in-

creased, many of our better physicians simply left the coal fields for private practice. Today there is a great shortage of physicians in these areas and it is a fertile field for osteopaths, chiropractors, and men with sub-standard training.

The camp physician is relinquishing much of his responsibility by referring most of his medical problems to the local hospital, and his medical ability atrophies in proportion. However, many of our coal camps are in the hands of competent medical men, members of our medical societies.

Concurrently with the medical services, about 75% of all of our miners receive hospital and surgical service through the check-off system, and in the South Appalachian areas this figure reaches about 96%. The services included under these plans vary greatly, but they usually include general medical and surgical service, limited obstetric service, diagnostic x-rays, and laboratory services. Rarely are the services of the specialist included. Generally excluded are normal obstetrical cases, venereal, mental, and contagious diseases, tuberculosis and alcoholism. These hospitals are simply not large enough nor equipped for handling such cases. The money deducted from the payroll is paid to the hospital direct and not through any insurance agency. In some cases the local unions have tried to administer their own hospital funds. They have been found not to be profitable or efficient under the management of the local union. They have always gone broke. The attitude of all parties toward such hospital plans is in general acceptable, but much criticism is expressed by miners and the hospital staff. Most of this criticism is due to the fact that insufficient funds are allotted properly to operate the hospital. Often certain hospitals are patronized owing to geographical location. However, most hospitals have been built and supported by these funds in rural mountainous areas where otherwise it would have been impossible for hospitals to have existed, and great groups of people have benefited from their services, even though in a limited way. These hospitals give a great sense of medical security to the miners. The payroll deductions of the miners for the hospital services vary from $2.00 to $4.80 per family. Rarely have these hospitals employed accountants to determine the proper rates, and the rates have been left low rather than introduce arguments with the unions. The Boone report has taken into consideration the many deficiencies and abuses of this system, and arrived at the following conclusion: "The present practices of medicine in the coal fields on a contract basis cannot be supported. They are synonymous with many abuses that are undesirable and in many instances deplorable." This report advocates the pre-payment plan financed by wage deduction, actuarially sound, and with free choice of physician and hospital, and on a fee-for-service basis. Some camps have established hospital funds, and the rates have been prohibitive, to the average miner's way of thinking. In all fairness I must say that the privilege of using such funds has been grossly abused by physicians as well as the miners. There is a tendency for this to happen to all insurance funds, and it has overcrowded our hospitals in the past few years. A survey in the coal fields shows that approximately 25% of our hospitals are over 100-bed capacity and can be considered as large hospitals. These larger institutions are in our population centers such as Pittsburgh, Wheeling, Knoxville. However, the miners depend almost entirely upon the smaller hospitals, that is, under the 100-bed capacity. The facilities such as operating rooms, delivery rooms, x-ray equipment and nurseries in general have been found below basic requirements. The laboratories were more on a par basis, undoubtedly due to the requirements of the U.S. Public Health Service for pre-marital Kahn examinations. The personnel of these hospitals show a severe shortage of trained nurses and specialists in the medical and surgical fields. Physicians were carrying a patient load of 300 to 350 admissions each year. The average load was larger in the smaller hospitals. About 50% of the hospitals met the requirements of the American College of Surgeons. The percentage of these accredited hospitals is highest in Pennsylvania and West Virginia; and lowest in the South Appalachian area.

THE MINE PHYSICIANS ASSOCIATION was formed in 1946, the purpose being to encourage better medical and hospital services in the coal fields and to include all physicians associated with the coal mining industry. A survey by this Association showed surprising low rates for these services. Annually an average over-all payment of $48.00 per family under this wage deduction was paid. This does not compare favorably with $120.00 for each family carrying commercial policies. This Association has tried to sponsor contracts with rates that would finance good hospital care. A few such contracts have been made, but it is difficult to obtain fair rates owing to the fact that the attempts to get them have been resisted by most of the local unions. About three years ago the Health and Welfare program of the United Mine Workers was established. This was financed by a 20-cent royalty on each ton of coal mined. Recently before a Senate investigating committee a statement was made that so far this royalty had reached a total of more than $150,000,000. The 1949 collections on about 500 million tons of coal should be approximately $100,000,000. This amounts to about $1.30 per day for each miner. This welfare program was organized by a Medical Advisory Board of which DR. ROYD R. SAYERS is Chairman and DR. WARREN F. DRAPER is Executive Director. Both of these men were formerly of the U.S. Public Health Service and are experienced in organization work. They have divided the coal fields into 10 sections with well-trained physicians in charge of each one. At present the

funds are providing payment for: (1) Pensions to retired miners. (2) Temporary welfare for disabled miners. (3) Medical care for disabled and retired miners and their families who are no longer under the pre-payment medical care plan. (4) Payment of medical care for specialty service not included under the limited provisions of the medical care plan. I do not know of any attempts to be made to finance housing, sanitation, or any social service activities in the camps. I am led to believe that eventually this program will take over the prepaid medical care plans as now practiced and establish a plan giving free choice of physicians and hospital to every miner.

IN CONCLUSION I believe that contract practice has filled a very definite need in the development of medical service in the coal fields. It has received much criticism but it certainly has rendered a great service. Many excellent physicians have spent useful lives in this work. The coal fields are located more or less in the rural mountainous part of America and there has always been a great need of physicians to serve these areas. However, today about two-thirds of our miners do not live in mining camps; so they are not limited to restricted medical care as they have been in the past. Thus contract practice is not so essential. At present I believe we would require at least a 50% increase in medical personnel and hospital facilities, especially in the South Appalachian fields to carry out this program. Eventually the program for medical care should be more inclusive so as to embrace a comprehensive medical, surgical, obstetrical and hospital service as well as sanitation, nursing, instruction in personal hygiene, housing and social service. Surely every mother should have modern obstetrical care in a well-equipped hospital. In developing this program a careful study of the philosophy of the miner himself is most important if his cooperation is to be had. Many good physicians have left the coal fields because they did not understand the miners' way of thinking. My personal experience with the union and the management has been very pleasant and both have been cooperative. In the past there has been some criticism of the influence of both management and labor on the medical profession. Our profession should keep free from any dominating influence. At present the welfare and retirement organization is supplementing the limited medical and hospital service. It is also making a survey of the coal fields before committing itself on a future program. Many times in the past the unions have attempted to establish local hospitals and, as far as I know, every such plan has failed. These failures are due to the fact that untrained, non-medical personnel representing hospital committees from the local unions have been in charge. However, the United Mine Workers have chosen well-trained medical directors for this welfare program. As the physicians in the coal fields become acquainted with this program they will have confidence in it and believe in its future success. The physicians in charge of the program have committed themselves as being against socialized medicine. Their experience in the coal fields where there has been no free choice of physician has not been pleasant. Undoubtedly they will follow most of the recommendations of the Boone report in attempting to give free choice of physician to the miners in the future. This long-range program will have to be attained gradually. It is a great concession on the part of the coal industry to the welfare of the miner and his family. I believe it will be successful in giving us a more competitive and progressive medical service in the coal fields. Let us hope that they use these great sums of money wisely.

Referrals to the Family Physician

IF A STUDY just completed by Columbia University's School of Public Health in New York City is a criterion, the industrial physican plays a vital role in the prevention and early diagnosis of disease among production workers. Results of the investigation, reported by DR. LEONARD J. GOLDWATER, Professor of Industrial Hygiene at Columbia, reveal that in two comparable industrial plants in New York City, the one that maintains an industrial physician had more than twice as many of its employees visiting family physicians during a year's time as did the one that does not keep a doctor on its rolls. "It is evident that the plant physician passed on to the family doctors more than once again as many patients as they would ordinarily see from the group." The study was conducted by DR. GOLDWATER and DR. MEYER ROSENBLUM, also of Columbia. The plant with a physican in attendance referred to family doctors 17% of the plant personnel, as contrasted with the non-medical service factory in which only 7.3% of its employees visited their doctors. The plants were as closely alike in make-up and numbers of workers and type of work as could be found. The employees numbered approximately 1,000 at each.

A New Treatment for Superficial Mycoses

LOUIS SCHWARTZ, M.D., MURRAY ROBINSON, M.D.,
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MORE than 100 years ago Lagenbeck demonstrated that thrush is caused by Oidium albicans and Schoenlein proved that favus is caused by Anchorion schoenleinii. These were the first discovered fungi pathogenic to humans. Shortly after the fungi causing tinea circinata and tinea versicolor were described. It was not until about 30 years later (1870) that Tilbury Fox described the fungus causing tinea pedis.

The dermatologists of Europe in the latter part of the 19th and the beginning of the 20th centuries (Sabourand, Castellani, Jadassohn, Bloch) advanced the study of diseases caused by fungi, and most of their findings are still accepted. In the United States valuable contributions to our knowledge of the superficial mycoses were made by Williams, Dodge, Weidman, Henrici, Hopkins, Sulberger, Peck, and Lewis. From the dermatologic literature, it seems that superficial fungus infections, especially tinea pedis, are more prevalent in the United States than in Europe.

The early dermatologists in Europe soon recognized that the superficial mycoses may manifest themselves by acute inflammatory lesions as well as by low grade chronic ones, and stated that the therapy should be governed by the site, extent and degree of inflammatory reaction. They used wet dressings to allay acute inflammations and followed by the topical application of the then known fungicides, chief among which were the mercurials, sulfur, iodine, coal tar and phenolics.

The principles of treatment stated above are still accepted, but many new efficient fungicides have been discovered which are less irritating than those first used. Moreover, the ointment bases in which the early fungicides were incorporated, such as lard, lanolin and petrolatum, are not conducive to easy contact of the fungicide with the pathogenic fungus.

As early as 1943 we realized that fungicides were but poorly released from greasy water insoluble bases such as petrolatum and lanolin. Therefore, in the experiment on the treatment of epidemic ringworm of the scalp conducted by the U. S. Public Health Service at Hagerstown, Maryland,[1] we began using a water soluble greaseless base (carbowax 1500, 1520, and 4000) into which we incorporated the fungicide used for topical treatment. The most efficient formula among 17 tested was found to be:

Salicylanilide (Trade name, Shirlan Extra) 5%
Cationic detergent (Trade name, Hyamine 1622) 1%
Carbowax 1500 .....94%

The adoption of carbowax by manufacturers as a base for fungicidal ointments and the work of Zhentlin and Fox confirm our earlier opinion that medicaments used for topical application should be placed in water soluble or water miscible bases. Salicylanilide has been known in industry for many years as a textile processing fungicide. As "Shirlan" Extra it comes in the form of a brown powder and is a non-toxic fungicide first used for the mildew-proofing of textiles. The Hyamines are quaternary ammonium compounds (cationic detergents), having marked fungicidal and antiseptic properties as well as wetting, penetrating and detergent properties. Hyamine 1622 was first used in our formula, but Hyamine 3258 was substituted because it was milder, giving no reactions on 177 subjects that were patch tested and because it was more readily obtainable.

Both "Shirlan" Extra and the Hyamines were patch tested on 200 subjects for skin irritant and sensitizing properties and in low concentration were found to cause only mild irritation on less than 1% of the test subjects. Since the combination of salicylanilide and Hyamine proved efficacious in the treatment of epidemic tinea capitis, we began to try it in the treatment of tinea pedis, a disease which is always with us.

One of the predisposing causes of tinea pedis is moisture (others are heat and epidermal detritus) and the ointment base form of medication has no drying effect even when carbowax is used. Therefore, the "Shirlan" Extra and the Hyamine 3258 were dissolved in isopropyl alcohol, which has dehydrating and penetrating properties, and in addition is antiseptic and fungicidal. Alcohol is also volatile and evaporates soon after application leaving the salicylanilide and Hyamine deposited on and in the pores and crevices of the dehydrated skin. The formula:*

Salicylanilide (Shirlan Extra) 5%
Trimethyl octadecyl ammonium pentachloro phenate (Hyamine 3258) 1%
Isopropyl alcohol 94%

was put up and tried on cases of tinea pedis, tinea cruris, tinea capitis and other superficial mycoses. It was found that this solution acted even more rapidly on the ordinary forms of tinea pedis than did the ointment in the carbowax base.

The solution can be applied with a pledget of cotton on an applicator or with a small brush. The feet and interdigital spaces should first be cleaned, dried, and freed of dead skin, and the fissures exposed. Small vesicles may be antiseptically opened. The fungicidal solution is then applied and the parts left uncovered until the solvent evaporates. There is an immediate relief or marked lessening of the pruritus. The application may be made twice daily, morning and evening. As a prophylactic measure after the case is cured, it can be applied every other day.

Acutely inflamed cases should first be treated by soothing soaks or wet dressings such as aluminum acetate 1-1000** until the acute symptoms have subsided. This may take from two to nine

*Fungi-Treat, Dome Chemicals, Inc.
**Domeboro Tabs, 1 to a quart of water.

TABLE 1.

Type of Case	No.	Cured	Time in days	Av. Time	Improved	Remarks
Interdigital fissures, scales, maceration	25	24	7-35	20	1	The improved case also had paronychia
Interdigital fissures, vesicles, maceration	8	7	4-28	18	1	The improved case also had a pyodermia of the feet
Acutely inflamed entire foot, vesicles and exudate	5	5	14-42	21	1	Soaks or wet dressings for the first 7-9 days
Tinea cruris	5	4	7-21	12	1	In the improved case treatment of the tinea cruris was not begun until tinea pedis had cleared
Tinea circinata	1	1	14			
Onychomycosis	4	0			4	Nails were pared and solution painted on twice a day. Cases treated from 4 weeks to 4 months
Interdigital fissures, maceration and moniliasis of penis and scrotum	1	1				Cured of tinea pedis but the moniliasis is stationary. Wife has moniliali-vaginitis.
Moniliasis external auditory canal	1	1				
	50	43			7	

days. The fungicidal solution may then be applied and allowed to evaporate before the stockings are put on or a dressing applied.

Fifty consecutive cases of superficial fungus infections were treated with the solution by the authors. In 12 of these the fungus was identified. Forty-three cases were clinically cured. No case was reported cured until it had been without treatment for from three to seven weeks and symptoms had not recurred. Table 1 shows a summary of the cases.

CASE 1: D. T.; white; female; 31; date 11-11-48; duration: several years.

Location of lesions: All the interdigital spaces of both feet.

Description of lesions: Skin in all interspaces deeply fissured and scaling with extension over the soles and sides of both feet.

Culture: No culture obtained after four weeks.

Diagnosis: Epidermophytosis interdigitale.

Treatment: Fungi-Treat painted on twice daily.

Progress: 11-22-48, lesions on soles involuting, fissures between toes disappearing; 12-3-48, clinically cured.

Intradermal tests: Oidiomycin; trichophytin 0.

CASE 2: C. H.; white; male; 54; date 11-9-48; duration: many years.

Location of lesions: Outer three interdigital spaces both feet.

Description of lesions: Fissuring and desquamation of the epithelium on the outer three interdigital spaces, most marked in the third interspaces of both feet. The underlying base is red and weeping. This reaction extends onto the sole.

Culture: Shows t. mentagrophytes.

Diagnosis: Epidermophytosis interdigitale.

Treatment: Fungi-Treat brushed on affected areas twice daily.

Progress: 11-13-48, erythema decreasing, scaling and fissuring still remain; 11-17-48, improvement; 11-20-48, erythema absent, some scaling; 12-3-48, slight scaling; 12-7-48, no clinical signs of lesions can be seen.

Remarks: Clinical cure within one month after beginning treatment of this moderately severe case.

CASE 3: S. J.; white; male; 46; date, 11-4-48; duration: long history of fungus infection of feet with recurring attacks of "id" of hands; has had much treatment in the past (x-ray, etc.); at the time of this treatment his hands were clear; there was scaling between all toes; fissures between 4th and 5th toes and vesicles in both insteps.

Treatment: Aluminum acetate soaks, surgical opening of vesicles. Soaks were continued for four days. Calamine lotion (with phenol 1%) was used for three days. Then Fungi-Treat was begun, 11-12-48, and continued until 11-28-48, when feet were clear. All treatment was stopped.

He was observed on the following dates: 11-30-48; 12-3-48; 12-17-48; and on 12-28-48 he was discharged as clinically cured.

CASE 4: L. H.; white; male; 23; date 11-16-48.

Location: Vesicles and maceration between toes and on soles of feet. Many denuded areas. Has had recurring foot trouble for several years.

Treatment: Aluminum acetate soaks several times a day for four days. Boris acid 5% ointment between soaks. Boris acid ointment with foot soaks at night for five days more. Fungi-Treat painted on once a day for two weeks, beginning 11-26-48, and stopping December 10, when his feet were clear.

Observed: 12-17-48; 12-23-48; 1-13-49.

CASE 5: B. M.; white; female; 22; date 11-4-48; duration pregnant four months; moderate tinea cruris of three weeks duration.

Treatment: Fungi-Treat painted on affected area once a day. After medication was dry, area dusted with borated talcum powder (Johnson's Baby Powder). Treatment was continued daily for one week then every other day for two more weeks. She was seen on 11-4-48, 11-10-48, 11-18-48 and 11-25-48 when treatment was stopped because all lesions had cleared.

Observations: She was observed on the following dates: 12-2-48; 12-9-48; and on 12-16-48 was discharged as cured.

CASE 6: L. S.; male; 20; date 11-19-48; duration: six years; duration of last attack, one month.

Location of lesions: Interdigital spaces, soles and hands.

Description of lesions: Fissuring and scaling in all of the interdigital spaces. The scaly placques are sharply demarcated with vesicular edges and extend from the interdigital spaces onto the soles of both feet. On the soles at the arches, numerous groups of vesicles are present in all stages of development. Similar vesicular eruption is present on the sides of all fingers.

Culture: Material taken from tops of vesicles on soles and scrapings between toes positive for t. mentagrophytes.

Diagnosis: (1) Epidermophytosis. (2) Epidermophytida.

Treatment: Fungi-Treat applied twice daily to feet; x-ray to hands.

Progress: 11-23-48, definite improvement; many of the vesicles on both hands have discharged their contents leaving scaling areas; the fissures in the interdigital spaces have healed; 11-26-48, the vesicles on the soles have involuted; there is still considerable scaling between the toes; 12-7-48, the lesions on the hands are completely fading; 12-14-48, practically no scaling left between the toes; 12-21-48, with the exception of the involuting vesicles on the palms and soles, no lesions remain.

Remarks: This case although severe responded very well. Clinical cure occurred within one month.

Intradermal tests: Oidiomycin, trichophytin.

SUMMARY: Fifty successive cases of superficial fungus infections were treated by the topical application of a solution of salicylanilide and Hyamine 3258 in alcohol; 43 cases were clinically cured, and seven were improved.

Of 38 cases of tinea pedis of varying degrees of severity, 36 were clinically cured in an average time of less than three weeks. The other two cases were much improved. Four out of five cases of tinea cruris were clinically cured in an average time of 12 days. Four cases of onychomycosis improved, but were not cured in from one to four months of treatment.

CONCLUSION: The solution of salicylanilide and Hyamine 3258 in isopropyl alcohol is an efficient topical application for the treatment of superficial mycoses. It is stainless, easy and convenient to apply.

(915 Nineteenth St., N.W., Washington 6, D.C.)

Reference

1. SCHWARTZ, L., PECK, S. M., BOTVINIK, I., LEIBOVITZ, and FRASIER: Control of Ringworm of the Scalp among School Children in Hagerstown, Md. *J.A.M.A.*, 132: 58-62, September, 1946. Also *Public Health Bulletin* No. 294.

Obesity in Industry
—The Problem and Its Solution—

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OBESITY is costly to industry in three ways. *First*, as a predisposing factor in hypertension, arteriosclerosis, heart disease, diabetes and nephritis, it swells the mortality lists with the names of individuals who are cut off during the most productive years of their lives. *Second*, as a predisposing cause of osteoarthritis and other crippling diseases, it impairs efficiency and reduces valuable men to a state of dependency. *Third*, low calorie diets, which have been the mainstay of treatment of obesity, bring about lassitude, weakness and decreased productivity among those who strive to reduce their weight.

The solution of the problem has not been found in appetite-reducing drugs, hormones or strenuous physical exercise. As measures of controlling obesity these things are, at best, of dubious value.

In view of the importance of the problem, it seems relevant to review the physiology of weight loss to determine if a more precise application of known principles will not bring better results than have been achieved in the past. To present a review of those principles and the results of their application is the purpose of this paper.

BY WHATEVER means weight loss is to be accomplished it is obvious that the fatty deposits of the body must be mobilized and converted into utilizable forms of energy, for adipose tissue can not be burned *in situ*. Mobilization of fatty deposit occurs under the influence of an anterior pituitary hormone. Fat enters the blood stream as lipids. In the liver these are oxidized to ketones which re-enter the blood and circulate to muscles, glands and other tissues where they are combusted to carbon dioxide and water. This is the chain of events which occurs when a person loses weight. Low calorie diets accelerate the process by keeping the blood sugar at a moderately low level, thus reducing the stimulus to insulin formation in the pancreas. Two effects arise from this. First, the fat-mobilizing hormone of the anterior pituitary, ordinarily inhibited by insulin, is allowed to operate more freely. Second, glycogen storage in the liver, ordinarily aided by insulin, is decreased, thus allowing fat the preferential use of available oxygen in its conversion to a utilizable form.

Examination of these facts, which are now standard textbook physiology, gives a clear-cut rationale for the low carbohydrate, high protein diets in common use. Carbohydrate must be kept low; otherwise it would cause high peaks in the blood sugar level and stimulate the pancreas. Protein, however, allows glucose to form slowly by the process of neoglucogenesis, so that such peaks are avoided. Additional advantages of protein are its content of methionine, the precursor of choline, a lipotrophic substance, and also its "specific dynamic action." Furthermore, protein protects the liver, and this removes any qualms concerning a somewhat drastic reduction of carbohydrates in the diet.

Only a moderate degree of success has been achieved with low calorie diets. Disadvantages are lassitude and weakness, with reduction in the individual's energic output. Hunger, also, is a great problem, and has led to discontinuance of treatment in a woefully large number of cases.

Any improvement in method of weight reduction requires a reconsideration of the role of fat in the diet, for the roles of carbohydrate and of protein are well established. Heretofore, the question of fat in the diet of the obese has been dismissed with the thought of its high caloric value. Emphasis has been put on the relationship between caloric intake and energic output. The latter is not ordinarily amenable to measurement but often seems to decline in a line almost parallel with the reduction in caloric intake.

Important advances have been made in our knowledge of fat metabolism in the past decade. Notable is the fact that the tissues of the body normally utilize ketones for energy in enormous amounts, without the simultaneous oxidization of carbohydrate. The colorful but incorrect statement, "fats burn in the fire of the carbohydrates," holds no place in modern medical practice.

SEVERAL advantages should be expected to ensue from a use of fat in a weight reduction diet in amounts more liberal than has been customary in the past. The carbohydrate formed from its glycerol fraction through neoglucogenesis does not enter the blood fast enough to bring about the high peaks in blood sugar which stimulate the pancreas. Thus, the action of the pituitary in mobilizing adipose deposits is not inhibited, nor is lipotrophic activity hindered in the liver. Fat in the diet does not interfere with the normal process by which the adipose deposits of the body are mobilized, converted to ketones and utilized as energy. With the liver expending its available oxygen on the conversion of fats to ketones, the tremendous ability of the peripheral tissues to oxidize the latter for energy can be brought into play to utilize those fats which are mobilized from adipose deposits in the body as well as a considerable amount of fat in the diet. Weight loss would be expected and, along with this, in-

creased physical energy and sense of well-being, as a result of the increased total combustion of nutrient materials.

This has been actually found to be the case in a series of 20 obese individuals who lost an average of 22 pounds each, in an average time of three and a half months. The range of weight loss was from 9 to 54 pounds, and the range of time was from one to six months. The cases are tabulated in the accompanying table.

TABLE 1.

Case No.	Date	Wt. (Lbs.)	Date	Wt. (Lbs.)	Lbs. Lost
1	10/21/48	231	4/18/49	177	54
2	9/16/48	190	2/18/49	165	25
3	12/14/48	202	3/15/49	188	14
4	9/8/48	263	2/18/49	217	46
5	12/3/48	201	3/24/49	181	20
6	2/8/49	177	4/13/49	159	18
7	3/3/49	277	4/15/49	261	16
8	11/24/48	180	3/7/49	168	12
9	10/18/49	217	3/10/49	193	24
10	11/1/48	204	4/11/49	184	20
11	11/10/48	213	4/1/49	191	22
12	2/17/49	187	4/19/49	172	15
13	10/20/48	268	3/21/49	234	34
14	11/3/48	182	12/20/48	172	10
15	11/16/48	176	4/6/49	167	9
16	12/16/48	176	4/21/49	163	13
17	11/22/48	210	3/18/49	187	23
18	2/15/49	206	4/15/49	196	10
19	10/11/48	165	4/21/49	144	21
20	2/8/49	193	3/23/49	174	19

The daily diet included two to three ounces of fat at each of the three meals of the day. Protein and carbohydrate, combined, were given in a minimum of three times this amount. The high protein, low carbohydrate principle was maintained.

Those who followed this diet reported increased energy and sense of well-being. Notable was a lack of hunger between meals. Objective signs of improved health were evident, particularly a reduction in blood pressure in hypertensives. Some urine tests for ketones were run, but none was found. Apparently, these individuals were utilizing as energy the six to nine ounces of fat consumed along with three or more ounces of fat mobilized from their own adipose deposits daily.

Salt was restricted because of the tendency of the sodium ion to store water, but fluids were unrestricted. Sugar, bread and alcohol were not allowed. Foods notable as frequent allergic offenders were omitted. An inability to eat the required amount of fat was frequently encountered at the start but this disappeared quickly as a rule and was often replaced by a positive liking for fats. This was found to be true particularly among those who took a regular half-hour walk before breakfast. No strenuous physical exercise nor drugs were prescribed. Total caloric intake was unrestricted, for protein and fat were allowed *ad libitum* in the ratio of three to one, among those who desired to eat more than the basic diet of about 3000 calories given them.

SUMMARY: Principles of physiology indicate a valuable role for dietary fats along with a high protein, low carbohydrate diet, in a weight reduction regimen. Individuals who followed a regimen in which these principles were applied were able to reduce weight effectively without caloric restriction. Increased energy and sense of well-being accompanied the weight loss.

The Privilege of Health

IF THERE is one phrase that I think should be placed above the blackboard of every school and above the doorway of every public building, it is that *responsibility and privilege are inseparable*, and that applies particularly to the problem of health. Preventive medicine is still based upon the connotation that health is the absence of disease. Constructive medicine recognizes the fact that the treatment of the sick is an attempt at the reconstruction of health; whereas if you take the relatively healthy you can make them healthier, the same principle as the so-called "well baby" constructive medicine. It must be personal and not wholesale; and it must be emphasized that no one, by socialized medicine or by any other means, can give or buy health. Like esteem and respect, it must be earned. It is a privilege and not a right; and, as a privilege, it entails the responsibility for effort and self-discipline on the part of each individual to maintain his own.

—From an Address by EDWARD J. STIEGLITZ, M.D.

ASSOCIATION NEWS

AAIP&S

Now that a good many of the bills in connection with the Detroit meeting have been paid, it is thought that those who attended and paid the registration fee might be interested in knowing how the registration fee money was expended. The preliminary programs cost $1619.78, and the final programs $1509.60, accounting for more than $2.00 out of the $3.00 paid. Badges and registration cards were $377.45; awards and prizes, $465.00; lantern slide screens and operators for the meetings, $579.00; buses for the plant tours on Tuesday, Wednesday and Friday, $519.29; extra meeting room expense, $115.00; allowance for special speakers, $179.12—all adding up to $4364.24 out of gross receipts of $4443.00, leaving us $78.76 to apply toward some of the other costs of putting on the meeting. This is entirely aside from any of the expense in connection with the exhibit which has purposely been kept separate from the registration receipts. It shows, however, that these items can mount up to sizeable sums, and emphasizes that frequently when we attend a medical meeting we do not realize the amount of money that is expended for just the meeting itself. From the great number of letters as well as the comments received from those who were present at the Detroit meeting, we gain the impression that all who attended felt they got their money's worth many times over. And now it is already time to start planning for the 1950 meeting, which will be held in Chicago April 23 to 29 at the Hotel Sherman.

AT THE invitation of DR. E. L. MACQUIDDY, Associate Professor of Medicine at the University of Nebraska College of Medicine, DR. E. C. HOLMBLAD gave a series of lectures to the class on Industrial Medicine, May 10 and 11. On Monday evening, May 9, a dinner was arranged at the Omaha Club with some 26 persons in attendance, there being six or seven industrial physicians, DEAN HAROLD LEUTH, of the University of Nebraska College of Medicine, the three Judges of the Nebraska Workmen's Compensation Court, and representatives of many of the diversified industries in the Omaha area. It was gratifying to notice the tremendous interest of all of these individuals in the field of industrial medicine and occupational health; it is believed that this interest promises a real start in setting up a complete and comprehensive course in Industrial Health and Occupational Medicine at the University of Nebraska College of Medicine. One of the main functions of such a department would be to render service to the industries and workers in the State of Nebraska. An interesting commentary on the importance of the mechanization of the agricultural areas is the number of traumatic amputations involved in such things as corn pickers and other farm machinery. We are told that farm machinery in Nebraska amputates more hands and arms than are lost in all other industries in the entire state. Couple with that the hazards of weed killers and the various types of insecticides, and it's not long before the farm will be demanding its own kind of industrial medical service.

Railway Surgeons

FOLLOWING is the program of the Sixty-First Annual Meeting of the AMERICAN ASSOCIATION OF RAILWAY SURGEONS, Drake Hotel, Chicago, June 30-July 2, 1949:

Thursday, June 30

THE Painful Foot"—EMIL D. HAUSER, M.D.

"Practical Points in Skin Grafting"—G. KENNETH LEWIS, M.D.

"Present Methods for the Control of Dental Caries"—ROBERT G. KESEL, D.D.S.

"The Diagnosis and Treatment of Hyperthyroidism"—ARNOLD S. JACKSON, M.D.

SYMPOSIUM on "Intrathoracic Disorders": "Carcinoma of the Lung"—WILLARD VAN HAZEL, M.D.

"Newer Developments in Medical and Surgical Treatment of Pulmonary Tuberculosis"—GEORGE W. HOLMES, M.D.

"Advances in Surgery of the Heart and Great Vessels"—E. H. FELL, M.D.

"Pulmonary Embolism: Prevention and Treatment"—LEO M. ZIMMERMAN, M.D.

Friday, July 1

DEAFNESS and the Fenestration Operation"—GEORGE E. SHAMBAUGH, JR., M.D.

"Peripheral Vascular Disease: Recent Advances in the Diagnosis and Treatment"—FRANK V. THEIS, M.D.

"The Diagnosis of Occupational Dermatoses"—FRANCIS EUGENE SENEAR, M.D.

"The Management of Abdominal Injuries"—WILLIAM C. BECK, M.D.

SYMPOSIUM on "Bone and Joint Lesions":

"Congenital Bone Conditions Often Diagnosed as Traumatic"—ARTHUR H. CONLEY, M.D.

"Surgical Conditions of the Knee Joint"—H. KELIKIAN, M.D.

"Late Results in Fractures of the Neck of the Femur"—JAMES J. CALLAHAN, M.D.

"Surgical Lesions of the Spine"—FREMONT A. CHANDLER, M.D.

Saturday, July 2

DIAGNOSIS and Treatment of Injuries of Urinary Bladder and Urethra"—VINCENT J. O'CONOR, M.D.

"Functional Diseases Following Injury"—GILBERT H. MARQUARDT, M.D.

"Radiation Lesions of the Skin"—JAMES BARRETT BROWN, M.D.

"A Discussion of Unexpected Non-Cardiac Deaths"—JERRY J. KEARNS, M.D.

INDUSTRIAL MEDICINE

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"Upon What Meat . . . . ?"

FOLLOWING are three sentences from a resolution adopted by the American Council of Christian Churches, in convention at Denver, April 27-29: "For the State to usurp responsibility for the medical care of its citizens, whatever its name and title, constitutes an infringement of human freedom which God has not given the State. . . .Socialized medicine in any form, represents, we believe, a clear violation of the Fourth Amendment of our Constitution which guarantees 'the right of the people to be secure in their persons'. . . .The battle against State medicine is not for the doctors alone, but it belongs to all Christian people who cherish their own freedom as well as to the physicians." These expressions are interesting because they indicate an awakening of *thought* upon a matter which has been propagandized from Washington on almost a wholly emotional basis. The trend of this thought is toward the realization that, in spite of the sophistry of the social planners in high places, the Constitution is still the law of the land, and toward some careful inquiry as to how the proposed welfare schemes can be reconciled with its prohibitions. Among the questions being asked are: Where is the limit upon usurpation by the Federal government of the inherent and fundamental rights of the separate States? What are the legal boundaries of the individual "right of privacy?" What quirk of the taxing power is it that can concentrate upon the payrolls of those persons who, for the most part, don't need it—because they have it now at no expense to themselves—the whole burden of a service alleged to be for the benefit of all the others, who, whether they need it or not, will certainly use it the most. And thus on and on—to the final one: "Upon what meat doth this our Caesar feed" that he would make it *compulsory?* More and more of these questions will be asked—of those who, in assuming their offices, took the solemn oath to "protect and defend" the Constitution; if they ignore them, then of the courts. As Samuel Gompers said in 1916, regarding compulsory social insurance in cases of sickness, "we shall not stand idly by and give our assent."

New Journal

ANOTHER industrial medical publication has entered our field. It is called "Proceedings of The Society for the Study of Industrial Medicine," with the subtitle "Quarterly Journal of Industrial Medicine." The March, 1949, issue is the first number of the first volume and contains the following: "Ophthalmology in Relation to Industry"; "Eye Hazards in Industry with Special Reference to the Steel Industry"; "Health of the Benzol Plant Workers of Tisco"; "Psychological Mechanism of the Morale of Industrial Workers"; "Medical Supervision in Indian Industries"; "COLONEL J. R. KOCHAR'S Opening Speech at the Inaugural Meeting"; "Plea for an Association for the Study and Pursuit of Industrial Medicine," together with reports, reviews, abstracts, and members' news. The Editor is LT.-COL. NAJIB KHAN; he has an editorial committee of COL. J. R. KOCHAR, LT.-COL. A. F. LASRADO, MAJOR R. C. TARAPORE, and DR. L. JANAKI. The office is at Tata Main Hospital, Jamshedpur, Bihar, India; the business manager is MAJOR R. C. TARAPORE; the Calcutta business manager is MR. B. N. ROY, Tata Iron & Steel Co., Ltd., Tisco Review Office, 23-B, Netaji Subhas Road, Calcutta, India. The article, "Medical Supervision in Indian Industries," was written by DR. H. P. DASTUR, Medical Officer, Department of Industrial Medicine, Tata Industries, Ltd., Bombay. An excerpt, on page 8 of the front section herein, suggests some of the problems of industrial medicine as it is developing in that part of the world. We welcome this new Journal, and look forward to the exchange of much interesting information.

An *itch* stopped this machine

It might have been the new cutting oil that gave Joe the rash. Maybe the picnic ground last Sunday was dotted with pretty green poison ivy plants. Or maybe Joe is hypersensitive to insect bites.

Joe is home today. He feels as though someone were holding a blowtorch on him. His highly specialized machine will stand idle until the burning, maddening itch is relieved and he can get back on the job.

Dermesthetic Ointment*—CUTTER

—will give triple-action itch relief while the underlying cause is being treated. Three anesthetic agents** offer fast, overlapping, and prolonged topical anesthesia. The base is greaseless and washable, no bandage is required, and normal work routines continue uninterrupted.

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**Fast—BENZYL ALCOHOL
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NEWS, COMMENT, OPINION

Breakfast Habits

IRREGULARITY of the morning meal or skipping breakfast entirely decreases a person's ability to work. So does substitution of a cup of coffee for a good breakfast. Dr. W. W. Tuttle and colleagues at State University of Iowa, Iowa City, prescribed different breakfast regimens for six healthy young women. Work output was greatest, reaction time shortest, and the pattern of tremor magnitude the least when an adequate breakfast was eaten at a regular time.

—*Modern Med.*, April, 1949, from *J. Applied Physiol.*, 1:545-549, 1949.

New Era in New Mexico

THE New Mexico legislature has taken note of the atomic age. The governor signed a bill extending workmen's compensation benefits to include "occupational illnesses" which can be traced to working with "fissionable materials."

—*Camden, N. J., Morning Post.* **April 5, 1949.**

Texaco Fellowship

THE University of Cincinnati announced on April 14, the establishment by the Texaco Company, of New York, of a new fellowship in industrial medicine. The fellowship will be created at the Institute of Industrial Health of the university's graduate school of arts and sciences.

—*New York Herald Tribune*, April 14, 1949.

Tuberculosis Components

BECAUSE an industrial environment is supposed to be dirty, grimy, and dusty, it has, out of ignorance, been accused of being an incubator for tuberculosis. Such thinking disregards vital components outside of the working environment of the employee, such as the economic factor, living conditions, congested housing, improper nutrition, financial insecurity with all its attendant worry and personal and community hygiene.

—*Clip Sheet*

Profit

OUR contribution to the debate on profits is that profit is chiefly the result of productive effort; and for us the true measure of how much profit is necessary is the use for which it is intended; to maintain our company's stability and progress in the future; and to further our business to the best interest of employees, readers, stockholders and advertisers alike.

—ROY E. LARSEN, President, Time, Inc.

Emergency Breathing

THE plant hospital of Spang-Chalfant Division of The National Supply Company at Ambridge, Pennsylvania, has been equipped with an apparatus that administers oxygen to victims of electrical shock, irritant gases, carbon monoxide poisoning and other respiratory conditions. The device, known as a "Pneophore," is designed for use on persons whose breathing has stopped or has been impaired; the apparatus takes over the job of breathing. It is manufactured by Mine Safety Appliances Company; it was developed during the war to

91 OUTSTANDING SKIN SPECIALISTS

report these facts about Athlete's Foot:

[*From ARCHIVES OF DERMATOLOGY & SYPHILOLOGY, April 1942, pp. 670-675*]

1. Athlete's Foot develops not from exposure to new germs but from lowering of resistance to the germs almost always carried on the feet.
2. The use of germicides and disinfectants to prevent Athlete's Foot is potentially harmful and may lead to all kinds of irritations and aggravations of existing lesions of the skin and even to production of allergic and other dermatoses.
3. The best prospect for success in preventing fungus infections such as Athlete's Foot depends upon eliminating the use of skin-damaging agents and concentrating solely on the care and hygiene of the feet.

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administer oxygen to airmen wounded at high altitudes and unable to breathe with the standard aircraft oxygen equipment.

Periodicals Needed

THE National Committee For Chile is now receiving gifts for the library of the Medical School of the University of Chile at its new collection center in the Library of Congress, Washington. The newer materials in the library, including periodicals, books and reference materials, were totally destroyed in a recent fire. Medical periodicals of the last 10 years and recent medical books are urgently needed. Contributions of the same will be appreciated. Address National Committee For Chile, Room 318, Library of Congress, Washington, D.C.

Hospital and Medical

HOFFMANN—LA ROCHE INC., pharmaceutical and vitamin manufacturers of Nutley, New Jersey, have announced improvements in their hospital and medical care plan which is paid for by the company at no cost to the employees. Maximum daily allowances for hospital room and board have been increased from $6 to $8, with simultaneous increases in maximum allowances for other hospital charges, such as laboratory, x-ray, anesthesia, sera, oxygen, face mask and helium. In addition, there are special allowances for anesthesia and diagnostic x-rays in the doctor's office. Hospitalization and surgical benefits cover employees as well as their dependents. Benefits cover up to 31 days in the hospital for each disability and there is no limit to the number of unrelated disabilities covered by the plan. When employees have to stay home because of illness, they are reimbursed at the rate of $2 per office call, and $3 per doctor's visit at home or hospital; in such cases, the maximum allowance per disability has been raised from $75 to $150 per illness, regardless of the employee's age.

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Varicose Veins

CARE of the feet is important at Macy's Department Store in New York City, where approximately 70% of the 12,000 regular employees are women, but varicose veins, generally thought to constitute one of the principal occupational handicaps to "standing" workers show only a slightly higher than average incidence, DR. MICHAEL LAKE, medical director, said recently. Frequent rest periods, coupled with the use of semi-elastic floor coverings, such as resilient wooden platforms behind counters and rubber composition matting, have served to minimize the number of cases of varicose veins and painful feet among store personnel, DR. LAKE pointed out. "Non-elastic floors for persons who are on their feet most of the time generally lead to foot fatigue,"

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he said, adding that most younger employees have now learned how to take care of their feet. "In fact, the wearing of lower heels has greatly improved the health welfare of all women within the past five years. This is probably due to habits developed during the war." In a comparatively recent study, DR. LAKE, in collaboration with DRS. GERALD H. PRATT and IRVING S. WRIGHT, found that although the incidence of varicose veins was no greater among men who stand at work than among "sitters" and "walkers," there was a slight, but definite, increase among women. Macy's chiropodist, considered an essential member of the medical staff, handled 1424 cases in 1948.

—*Health on the Job*, April, 1949.

Health Material

NO MATTER how many media are used, or how much material employees take, the final criteria still are—how much value do they get from health education material? Many employers are convinced that they get a great deal. One says, "Reduction in loss of time due to health hazards is quite evident." Another comments, "Most of the employees take them home. . . .questions on health definitely prove the information is helpful in promoting better health." From these statements, and numerous similar comments, it is apparent that many more employers than formerly consider health education efforts well worth the trouble. That workers agree with them is also indicated by many remarks such as these—"good advice," "keeps us up to date," and "saved money in doctor's bills." Indeed, there are many comments indicating conviction that a timely message on appendicitis or cancer has been the means of avoiding serious trouble, and even of saving lives. It seems evident from such comments, and from other facts, that workers are becoming more and more receptive to well-presented information on health, made readily available. This is encouraging for health educators, but here, as in other fields, nothing remains static. The greater the alertness to changing wants and needs in type of material and ways of presenting it, the better the results we can hope to obtain in reaching workers with health messages.

—From "Metropolitan Life Teaches Health Through Many Media," by DONALD B. ARMSTRONG, M.D., Second Vice-President, in *Industrial Hygiene Newsletter*, May, 1949.

Cobalt

WITH such wide exposure to cobalt over such a range of concentration, it is of interest to consider the effects of inhalation of this dust or the dust of its compounds. Such effects have not been previously studied, although a certain amount of pharmacological data is available with reference to ingested cobalt compounds and to the intravenous injection of cobalt salts. While cobalt has been found to produce a certain amount of physiological response, the experimental work so far reported in the literature does not indicate that any great danger is associated with it. However,

many seemingly inert substances have proved dangerous on inhalation and further experimental investigation with reference to this phase of the problem is now in progress in this laboratory.

—From "Cobalt and the Dust Environment of the Cemented Tungsten Carbide Industry," by L. T. FAIRHALL, and H. P. BRINTON, *Public Health Reports*, 64:15, 485-490, April 15, 1949.

Award in Orthopedic Surgery

THE National Council of the Kappa Delta Sorority has inaugurated a prize of $1,000.00 to be given annually by the American Academy of Orthopedic Surgeons for the best research in orthopedic surgery performed during the year by an individual in the United States. The first award, for the year 1949, will be announced at the seventeenth annual convention of the Academy in New York, February 11, 1950. Those wishing to compete for this prize can secure further information from DR. WALTER STUCK, 1426 Nix Professional Building, San Antonio, Texas, Chairman of the Award Committee for 1949.

Research Laboratory

MINE Safety Appliances Company announces plans for a new laboratory devoted exclusively to industrial safety research. GEORGE H. DEIKE, President of the firm, stated that construction of the one-half million dollar building will start immediately. The structure is to be located one block from the company's Pittsburgh plant. DR. WILLIAM P. YANT, Director of Research and Development for the company since 1936, will be in charge of the laboratory.

—*Pittsburgh Post Gazette*, February 11, 1949; abs. in *Industrial Hygiene Digest*, February, 1949.

Institute Course

THE Institute of Industrial Medicine of the New York University-Bellevue Medical Center on March 3 inaugurated a course in medicine in industry for third-year students at the New York University College of Medicine. Extending over a period of 12 weeks, the course will include lectures in dust diseases, lead, solvents, dermatoses, psychiatry in industry, applied physiology of respiration as applied to dust diseases, organization and administration of industrial medical departments, physical factors in the industrial environment, the role of research and physical examinations. DR. ANTHONY J. LANZA is chairman of the institute.

Residencies

GENERAL Motors Corporation announces an expansion of its In-Plant Training Program for physicians wishing practical experience in industrial medicine and is prepared to accept 10 residents for the year beginning July, 1949. Each appointee will receive orientation instruction in General Motors Medical Procedure and Industrial Hygiene Control, followed by assignment to a General Motors plant for a year's resident training. Each plant medical department will be affiliated with a hospital approved for intern and resident training by the Council on Medical Education of the American Medical Association. Each candidate must be a

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(1 Freed, J.A.M.A., Feb. 8, 1947)

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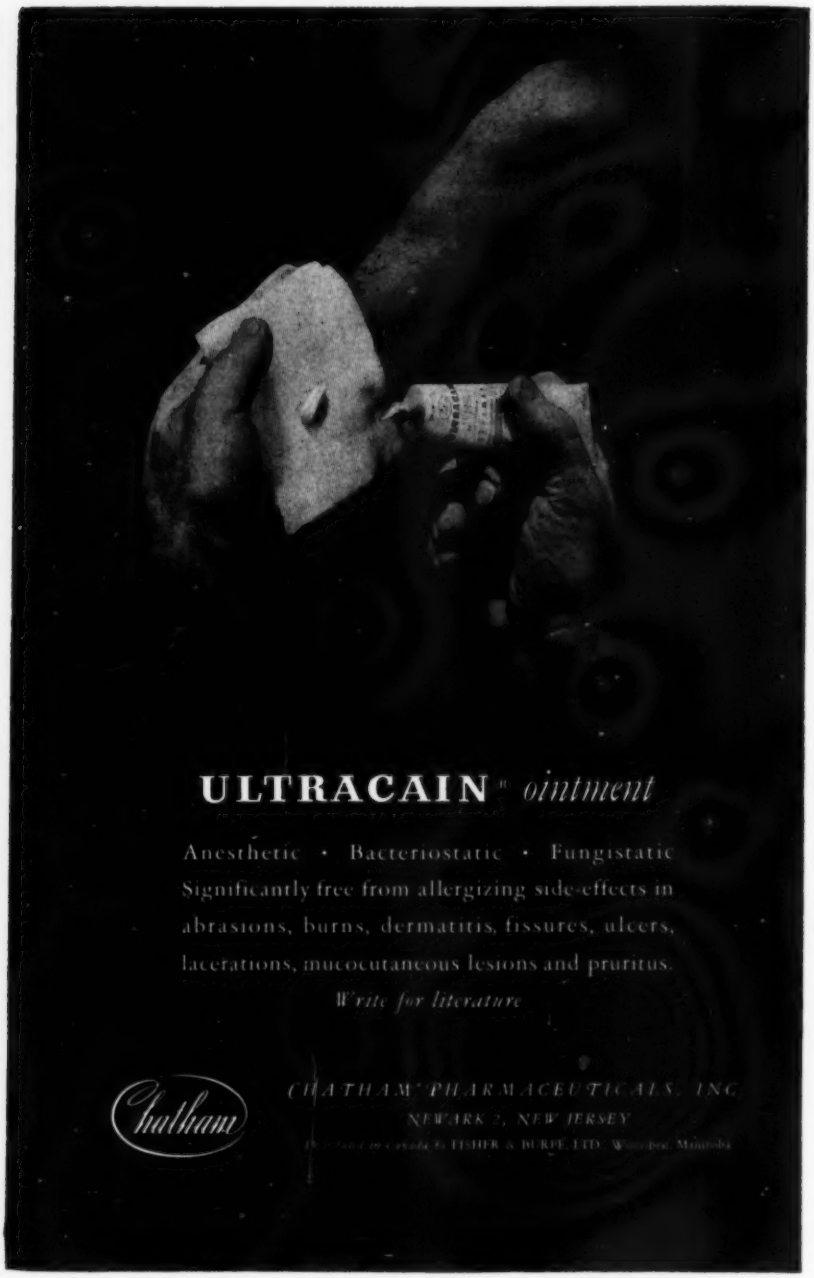

graduate of a Class A medical school, have completed at least a 12 months' rotating internship or its equivalent in hospital training, and have an interest in occupational health. He must also be licensed to practice medicine in the state to which he is assigned. Letters of application should be addressed to the Medical Consultant, General Motors Corporation, 3044 West Grand Boulevard, Detroit 2. —*J.A.M.A.*, March 26, 1949.

Fellowship

THE University of Colorado Medical Center, Denver, is offering a three-year fellowship in industrial medicine. The course will give advanced training in industrial medicine leading to the degree of Doctor of Industrial Medicine. The stipends will be $1,800 and $2,400 for the first and second years respectively. Appointments are made January 1 and July 1. This course is approved by the Veterans Administration for candidates who are eligible under the G.I. Bill of Rights. The first two years will consist of didactic work. Time and facilities for research will be provided, and a thesis will be required. The third year will be spent in training in industry under supervision. The stipend for this year will be announced later. Requirements include graduation from an approved medical school, at least one year of internship training, and preferably at least one year of residency training in one of the specialties or one or more years of practice of medicine. For further information write FRANK PRINCI, M.D., Director, Division of Industrial Medicine, University of Colorado Medical Center, Denver.

Responsibility

REGARDLESS of the type of disability, the responsibility of the physician to his patient cannot end when the acute injury has been cared for. It ends only when the physician has taken the responsibility for seeing that proper referral has been made to those agencies and institutions which are equipped to rehabilitate and retrain the patient with a residual physical disability. The physician who fails to see that those patients under his care receive the full benfits of modern methods of medical rehabilitation and retraining is in the same category as the physician who still persists in using dietary restriction alone in the management of diabetes, when insulin is available, for medical care is not finished until the patient has been completely rehabilitated and trained to live and work with what he has left.

—From "Rehabilitation," by HOWARD A. RUSK, M.D., in *J.A.M.A.*, May 21, 1949.

Inert Dusts

AT THE annual convention of the Greater New York Safety Council on March 25, DR. LOUIS M. WIENER, plant medical director of Morganite, Inc., Long Island City, said the "smog deaths" in Pennsylvania last year had emphasized the hazards of non-siliceous dusts. Metal fumes, produced in many industrial plants, resulted in absorption of altered protein material formed by the action of the heavy metal on the respiratory tissue. Wood dusts, regarded by some as a nuisance, are a serious health

complaints by workers in planing and woodworking mills of "chronic catarrh," DR. WIENER stated that an investigation showed tuberculosis morbidity and fatality among employees in such plants to be "about twice that found in worker population engaged in non-dusty production. Public health authorities, management and labor should get together and draft a code for working conditions whose goal should be the eradication of all dust hazards. Public health authorities and insurance agencies should expand investigating facilities for determination of dust concentrations in working areas."

Company Blood Bank

FIFTY plant and office employees of the Blatz Brewing Company, Milwaukee, have each contributed a pint of their blood to open a company blood bank which will serve all members of the Blatz organization. The bank will be operated in connection with the Junior League Blood Center, established in 1947 to supply all blood used in hospitals throughout Milwaukee County. Through the Blatz blood bank, all employees of the company become eligible to obtain such blood as may be needed by themselves or members of their families at the time of illness. With a basic credit of 50 pints established at the Center, withdrawals are charged against the firm at the rate of two pints for every pint of blood used. The second pint is given to the Center to build up its supply for use in other quarters. As withdrawals are made, new contributors maintain the basic credit level. The initial 50 donors were selected from a group of more than 250 Blatz employees, who volunteered at the first call. A mobile unit, staffed by doctors, nurses and volunteer workers, visited the plant to make the initial collection. Arrangements were made through the company's personnel department.

Admixture

DURING the past two years, I have traveled over a large part of the country and surveyed many industries of various types for the purpose of advising management of what can be done in a medical way to help them out. In this period of time I have never once run against a management which did not want to do something for the betterment of its workers, and that to me has been a revelation. In many instances I had been led to believe that some of them would not be interested in the slightest degree. Not all managements have agreed to go along with all of the recommendations made, but every management has promised to make a start. I am tremendously encouraged because the appeal of industrial medicine to management is more than just the appeal of dollars and cents savings. The appeal is an admixture of dollars and cents, and humanitarianism. We want, in this country, to get along with our fellow men and modern medicine has much to offer along that line.

—From "Modern Developments and Trends in Industrial Medicine," by CARL T. OLSON, M.D., presented at the First Gulf Coast Regional Conference on Industrial Health, Houston, Texas, October 14, 1948.

Standing Orders

TWO topics of discussion which, although taken up separately, eventually merged, were the legal-

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A UNIQUE METHOD of sharpening and bevelling, plus rigid inspection, assure unvarying uniformity of B-D needle points . . . an exclusive process of joining hub and cannula provides needles of consistently true bore, from point to hub . . . with every hub micrometer-gauged to insure perfect fit.

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INTENSIVE and continuous research has provided the optimal compromise between stiffness and flexibility in hypodermic needles . . . hyperchrome stainless steel . . . hard enough to hold a keen, durable point, flexible enough to provide maximum resistance to breakage from bending, never a leaky joint.

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BASIC DESIGN of B-D Needle point provides extra lateral cutting edges to insure relatively painless penetration. Solid, sturdy construction minimizes "fish-hooks", while the velvet-smooth finish of the cannula contributes further to the utmost in patient comfort.

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ity of standing orders and malpractice insurance for the industrial nurse. It was brought out that much of the controversy about standing orders stems from terminology alone. Industrial nurses, following orders left by an industrial physician or medical director, may frequently be put in the position of making tentative diagnoses on their own before carrying out standing orders. MISS F. RUTH KAHL, of the U.S. Public Health Service, suggested that a term such as "medical direction for care of patient" might be a substitute for the extremely controversial "standing orders." Litigations filed against industrial nurses who presumably thought themselves protected when carrying out standing orders were cited. MISS RUTH EISERMAN, Industrial Nursing Consultant, Bureau of Industrial Hygiene, Department of Public Health and Welfare, Ohio, stated that according to that state's law, if an R.N. has standing orders and has used reasonable care in carrying out the doctor's orders, she is protected against possible charges of practicing medicine. MRS. LENA LYONS of New Jersey stated that in her state the nurse is protected if she is working under a full-time medical director, for then he is responsible, *but* she is not protected, and is therefore responsible for her own actions, if under a part-time doctor.

—From "AAIN Annual Conference," by ALICE R. CLARKE, R.N., in *R.N.*, May, 1949.

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the DAXALAN-DOME-PASTE BANDAGE TECHNIQUE...

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This technique is based on a 3 point program

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the wet dressing of choice is DOMEBORO TABS. Promotes faster healing because DOMEBORO solution remains in a state of constant ionization, thus rendering it capable of correcting variations in the pH values of the skin.

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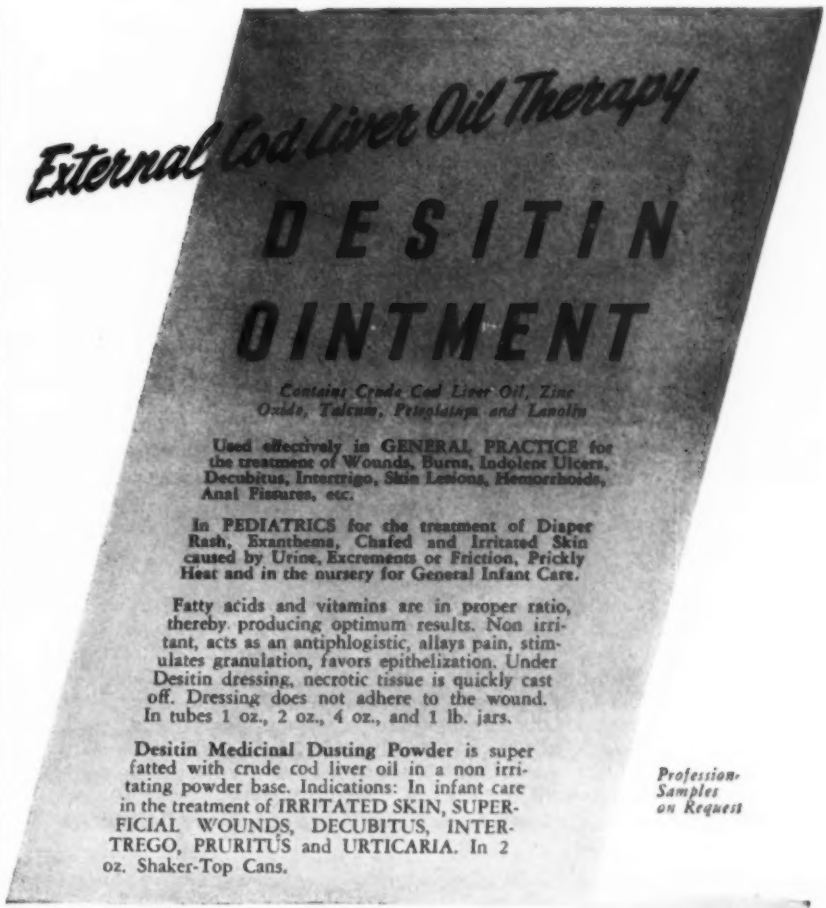
DR. PILGRIM

Now reading of various principles in medico-legal cases and types of problems encountered, among the material a paper written a few years ago by DR. FRED WISHARD on the subject of hernia ....AND listening to the NBC Symphony in Schumann's First, which is of great interest, as the Chicago Business Men's Orchestra is preparing this for the Spring concert of the series; and hearing the New York Philharmonic in Beethoven's Ninth with a great chorale....AND busy with reports and opinions with reference to medico-legal cases....AND journeying to Milwaukee for the Midwest Area Industrial Hygiene meeting at the Milwaukee Athletic Club, and during the afternoon a conference with HARRY NELSON and PAUL BREHM on workmen's compensation problems; and later to the reception and dinner where BILL YANT spoke well on "Borderlines of Industrial Hygiene and Safety"; and sitting with DR. PAUL BREHM, MESSRS. BIANCARDI, SCHOLTZ, WALWORTH, and SALLEE, and

DRS. YANT and MEITER....AND taking great pleasure in listening to the new series of health broadcasts "It's Your Life," on Sunday afternoons as 3:30, this having changed from a 15-minute period five days a week, which it recently occupied, the excellence of the series having been generally recognized and appreciated and having attracted great attention, as well as several awards.... AND studying the state panel system of physicians treating industrial injuries, which apparently is successful in Wisconsin and satisfactory in the majority of instances, owing, of course, to the perspicacity and intelligence of HARRY NELSON, along with a number of others who are similarly inclined in their views; and in conjunction with this, engaging in a series of discussions on various phases of medical relations in workmen's compensation, in an attempt to orient and rationalize the various contacts made by the physician in this type of work.... AND reading with amusement a non-sequitur by Senator Humphrey (Democrat—Minnesota) in which he tried to justify the program of compusory health insurance which has been supported by the administration, by the statement that two billion dollars a year are lost from the common cold—as if Dr. Truman's payroll tax were a "sure-fire" cure; and then running across press notices from a recent article in INDUSTRIAL MEDICINE concerning the use of pyribenzamine with apparent success in colds by DR. HALSTEAD G. MURRAY, of Dennison Manufacturing Company, at Framingham, Massachusetts .... AND studying reports of committees and subcommittees with reference to legislation, rehabilitation, and the employment of the handicapped; and, in the meantime, conversing with industrialists concerning possibilities of inspections and further investigations....AND listening to the Philharmonic play Beethoven's Pastorale Symphony and Dvorak's Fourth, which is not very well known, but certainly deserves more public performances; and playing the last or Spring concert of the Chicago Business Men's Symphony Orchestra, after having supper with MESSRS. KELLOGG, WOOD, VOIGT, MEINHARDT and WESTRATE, and greatly enjoying playing the First Symphony of Schumann and the other numbers on the program and the accompaniments for the soloist Vivian De la Chiesa, who certainly was brilliant in her performance.... AND greatly shocked by the news of DR. PAUL BREHM'S sudden passing, after being with him so recently during which time he seemed to be his usual fine self....AND to a large factory, after driving some 30 miles, contacting various officials, making a plant inspection, having conferences with various groups, and looking over many x-ray films; and during this time having four days of unseasonable weather, breaking all records for an early summer in May, which was suddenly changed on the evening of the fourth day by a reversal in the wind direction....AND reading with great interest and mingled emotions different types of material on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Fatty acids and vitamins are in proper ratio, thereby producing optimum results. Non irritant, acts as an antiphlogistic, allays pain, stimulates granulation, favors epithelization. Under Desitin dressing, necrotic tissue is quickly cast off. Dressing does not adhere to the wound. In tubes 1 oz., 2 oz., 4 oz., and 1 lb. jars.
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community atmospheric pollution, in which it seems that not only is the public confused, but also there are certain professional groups who appear to come to unjustified conclusions on very slim hypotheses—but so it is ever in problems where there are new factors of difficult measurement, especially for those who are not accustomed to critical evaluation; and meanwhile studying problems of household and industrial poisons with possibilities of antidotes or first aid measures.... AND welcoming to Chicago our old friends, ERLE and LUCILLE COLLINS from California, on their way back home, and driving around the buildings at Northwestern University, and having dinner at the Country Club, and thence to the train, with many a reminiscence of former times ....AND preparing for future appointments, especially with reference to litigation in a neighboring state, and also various coming meetings, among these the CENTRAL STATES SOCIETY OF INDUSTRIAL MEDICINE AND SURGERY and the annual meeting of the American Medical Association....AND reading with great interest of the successful operation of frontal lobotomy for the control of intractable pain in a number of different types of chronic lesions, which seems to promise much.

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Laryngoscope, Feb. 1935, Vol. XLV, No. 2, 149-154; Laryngoscope, Jan. 1937, Vol. XLVII, No. 1, 58-60; Proc. Soc. Exp. Biol. and Med., 1934, 32-241; N. Y. State Journ. Med., Vol. 35, 6-1-25, No. 11, 590-592.

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*Spies, T. D.; Suarez, R. M.; Lopez, G. G.; Milanes, F.; Stone, R. E.; Toca, R. L.; Aramburu, T., and Kartus, S.: Tentative Appraisal of Vitamin B_{12} as a Therapeutic Agent, J.A.M.A. *139*:521 (Feb. 19) 1949.

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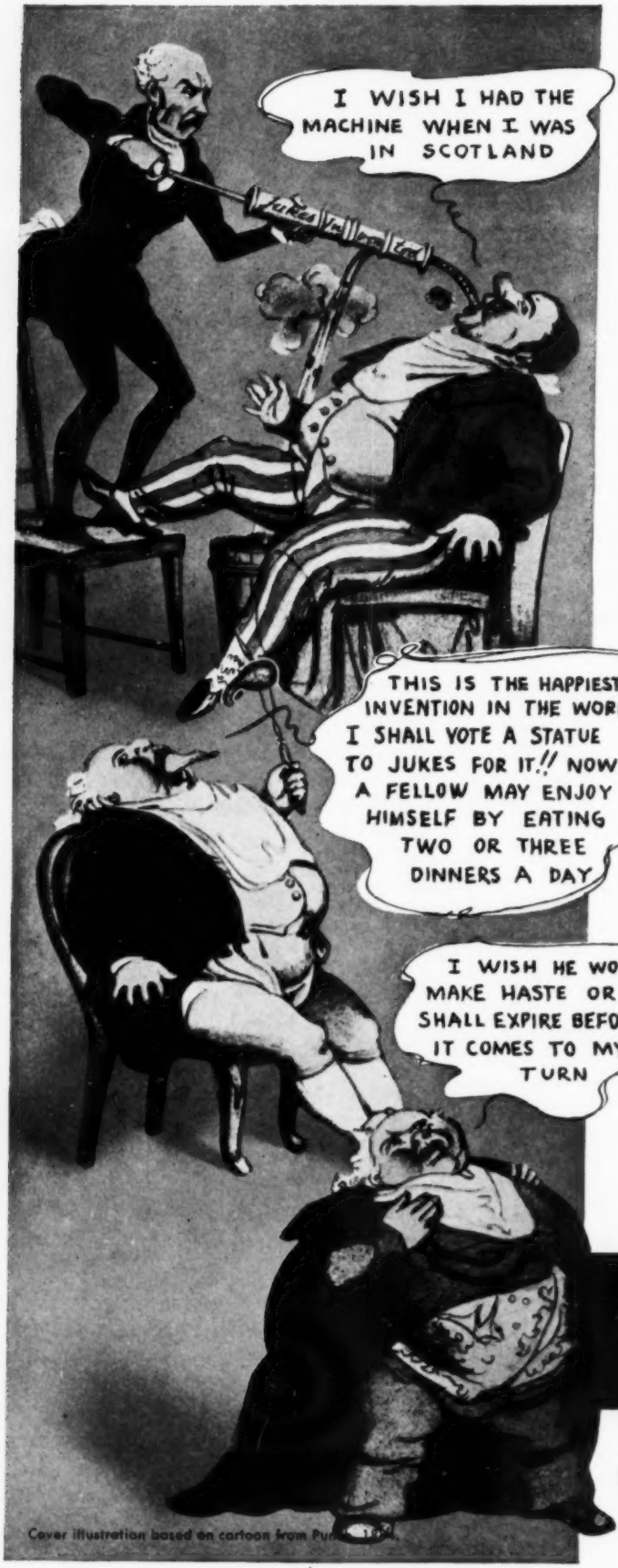
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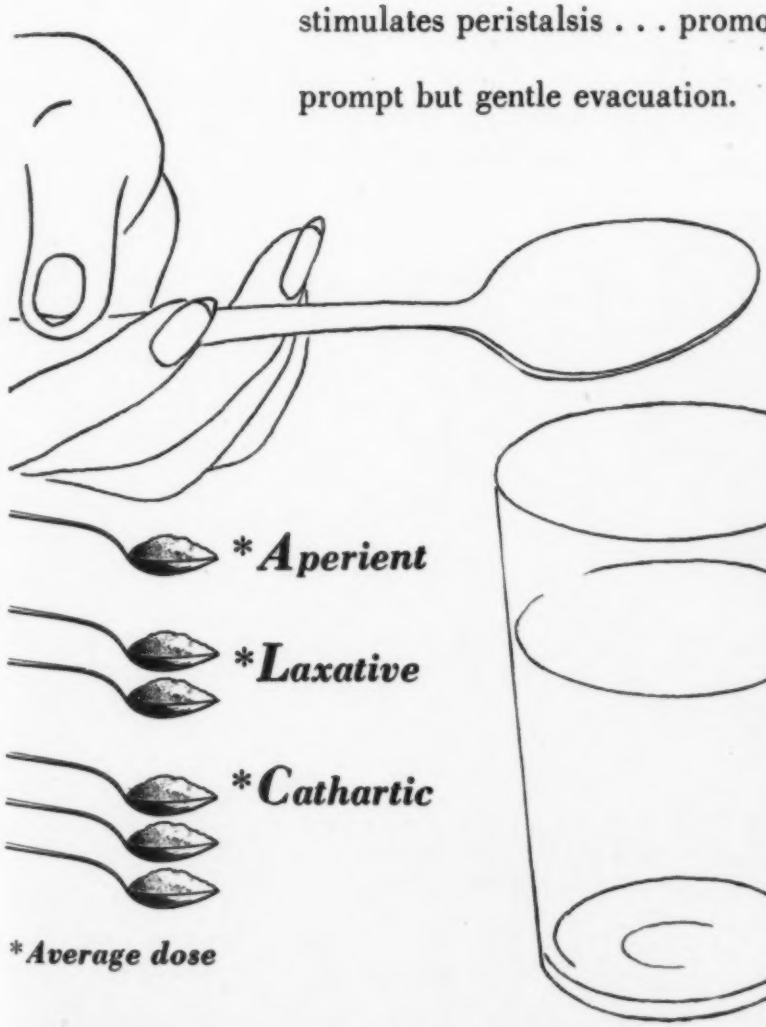

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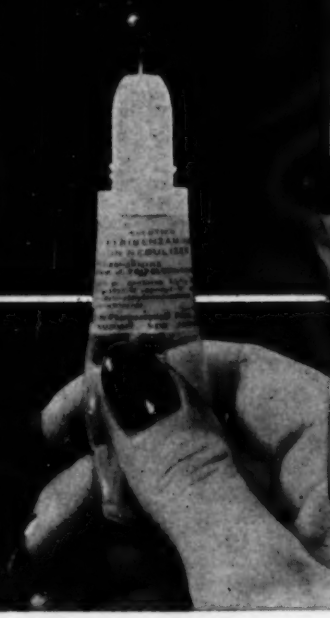

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